



# **NAVAL POSTGRADUATE SCHOOL**

**MONTEREY, CALIFORNIA**

**Physical, Nutrient, and Biological Measurements of  
Coastal Waters off Central California in June/July 2006**

by

Thomas A. Rago, Reiko Michisaki, Baldo Marinovic, Marguerite Blum, and  
Katherine Whitaker

February 2007

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University of California, Santa Cruz

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<b>13. ABSTRACT (maximum 200 words)</b>  The results of analyses of hydrographic, nutrient, and biological data collected in coastal ocean waters off Central California in June/July 2006 aboard the <i>NOAA Ship McArthur-II</i> are presented in both tabular and graphical form. The cruise departed from San Francisco, California, then proceeded from Moss Landing, California, to Point Reyes, California, following CalCOFI line 67 to station 90, thence to CalCOFI line 60/station 90, and finally along CalCOFI line 60. Marine mammal observations taken during the cruise are also included.				
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## **Introduction**

Following in a long tradition of hydrographic studies of the California Current system-- see, for example, Steger et al. (2000) and Collins et al. (2003)-- the data in this report were collected during the 27 June-2 July 2006 cruise of the Pacific Coast Ocean Observing System (PaCOOS) program aboard the *NOAA Ship McArthur-II*. The PaCOOS program was organized in 2003/2004 as the NOAA west coast contribution to the national Integrated Ocean Observing System (IOOS), and is charged with “providing the ocean information needed for the sustained use of fishery resources and protection of marine species and their ecosystem under a changing climate.”<sup>1</sup> PaCOOS cruises generally subsample the standard California Cooperative Oceanic Fisheries Investigations (CalCOFI) grid of hydrographic stations (figure 1). With a slight exception, this cruise did exactly that, sampling along CalCOFI line 67 from Moss Landing to station 90 (CTD casts 20-23), northwest to CalCOFI line 60/station 90 (CTD cast 27), then shoreward to Point Reyes, California, along CalCOFI line 60 (figure 2). The exception was that, to increase the resolution of the hydrographic data, eight CTD casts were inserted between the standard CalCOFI sites along line 67. Primary productivity and zooplankton analyses were not performed at these added sites. Participants on the cruise came from the Naval Postgraduate School (Physical Oceanography and Marine Mammal Observations), the Monterey Bay Aquarium Research Institute (Nutrient Analysis and Primary Productivity), the University of California at Santa Cruz (Zooplankton Analysis), and Brown University (Biological Oceanography).

## **Standard Procedures**

### *CTD/Rosette Data:*

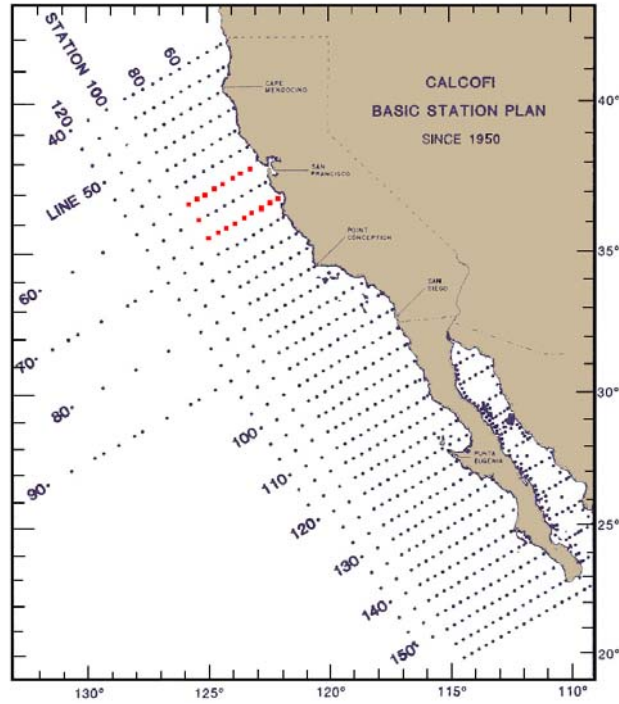
At each site a Seabird Electronics, Inc., Conductivity-Temperature-Depth (CTD) instrument fitted with a 12-place rosette was deployed. The rosette was equipped with 12 10-liter PVC Niskin bottles for collection of water samples. The CTD was generally lowered to 1000 meters or the bottom (whichever came first), except that casts were extended to the full ocean depth at CTD station 27 (4071 dbar) and about half the full ocean depth at CTD station 21 (2534 dbar). Where primary productivity sampling was performed, water samples were taken at depths designed to maximize resolution of the variables sampled throughout the thermocline. Where only nutrient sampling was performed<sup>2</sup>, water samples were more or less evenly spaced throughout the water column. A water sample was always obtained at or near the bottom of each CTD cast for later conductivity/salinity calibration of the CTD conductivity sensors.

Besides temperature (dual sensors), conductivity (dual sensors), and pressure, the CTD also measured fluorescence, transmissivity, dissolved oxygen content, and photosynthetically available radiation (PAR) in the water column. Except for PAR and the secondary of the dual sensors, all these parameters are reported here.

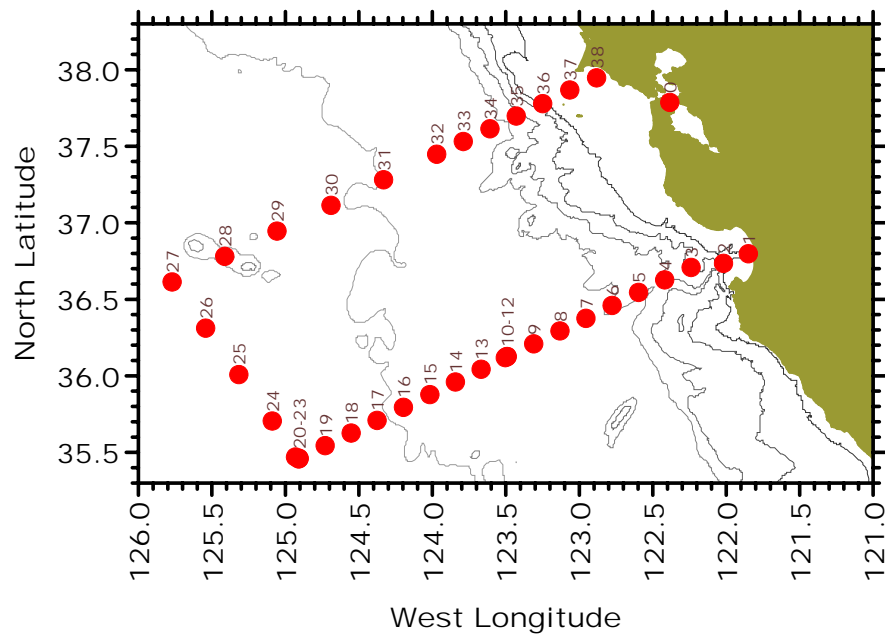
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<sup>1</sup> <http://www.pacoos.org/Pages/history.htm>

<sup>2</sup> CTD stations 3, 5, 7, 9, 11-13, 15, 17, 19, 22, and 23



**Figure 1:** Full CalCOFI hydrographic station grid. Stations occupied during the PaCOOS cruise of June/July 2006 are highlighted in red.



**Figure 2:** Hydrographic stations occupied during the PaCOOS cruise of June/July 2006. 200, 1000, 2000, 3000, and 4000 m isobaths are shown. CTD 0 was done at the pier in San Francisco.



Generally, a minimum of two salinity samples (including the bottom-of-cast sample) were collected from each CTD cast. These samples were analyzed during the cruise aboard the *NOAA Ship McArthur-II* using a Guildline model 8400B Autosol salinometer. A regression between the salinometer results and the conductivities measured by the CTD at the times the Niskin bottles were tripped was made, from which a correction to the CTD salinities was determined and then applied. The salinometer was standardized using IAPSO Standard Seawater (batch P145) before and after each set of water samples was analyzed. Salinity values were calculated using the algorithms for the Practical Salinity Scale, 1978 (UNESCO, 1981).

Dissolved oxygen (Winkler) samples were collected at CTD stations 2-6, 15, 16, 18, 21, 25-29, 31-33, 35, and 36. These were analyzed by Gernot Freiderich during the cruise aboard the *NOAA Ship McArthur-II*. The CTD for this cruise was outfitted with a Sea-Bird Electronics, Inc., SBE 43 oxygen sensor. This sensor is a polarographic membrane that outputs a voltage proportional to the temperature-compensated current flow occurring when oxygen is reacted inside the membrane. Dissolved oxygen concentration is then calculated from a modified version of the algorithm by Owens and Millard (1985). The results of the analysis of the Winkler oxygen samples were compared to the corresponding oxygen values recorded by the CTD. Using the method described in SBE Application Note #64-2<sup>3</sup>, we calculated new SBE 43 sensor coefficients. Corrected CTD oxygen values were then recalculated with the modified version of the Owens and Millard (1985) algorithm using the new sensor coefficients.

Nutrient samples were collected in 45-ml polypropylene screw-capped containers which were rinsed three times prior to filling. Samples were frozen and returned to MBARI for later analysis on an AlpChem autoanalyzer, as in Sakamoto et al. (1990).

Chlorophyll-*a* and phaeopigments were collected in 280-ml polyethylene bottles and filtered onto 25-mm Whatmann GF/F filters. Chlorophyll-*a* was assayed with the standard fluorometric procedure of Holm-Hansen et al. (1965), modified such that phaeopigments are extracted in acetone in a freezer over at least 24 hours (Venrick and Hayward, 1984; Chavez et al., 1991). Analysis was performed as possible during the cruise or at MBARI immediately following the cruise.

Primary productivity was estimated for the 100, 50, 15, 5, 1, and 0.1% light penetration depths as determined by secchi, and followed the general method of Parsons et al. (1984). Water samples from the appropriate depths were collected in 280-ml polycarbonate bottles, spiked with <sup>14</sup>C, and incubated on deck for 24 hours under running seawater in plexiglass tubes wrapped with nickel-cadmium screens of differing pore size. (See Pennington and Chavez, 2000, for methodology details.)

### *Zooplankton Net Tows:*

Twenty stations<sup>4</sup> were sampled for zooplankton during the cruise. All sampling was conducted with 0.7-m diameter paired bongo nets fitted with 505-mm mesh, which were towed obliquely to a depth of 210 m (or within 10 m of the bottom, whichever came first). Samples were preserved at sea according to standard protocols (Kramer et al., 1972). Upon return to the University of California at Santa Cruz (UCSC), all samples were initially measured for total biovolume and subsequently processed for krill species composition and abundance.

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<sup>3</sup> [http://www.seabird.com/pdf\\_documents/ApplicationNotes/Appnote64-2Aug05.pdf](http://www.seabird.com/pdf_documents/ApplicationNotes/Appnote64-2Aug05.pdf)

<sup>4</sup> CTD stations 1, 2, 4, 6, 8, 10, 14, 16, 18, 19, 27-32, and 34-37

### *Marine Mammal Observations:*

Observations of marine mammals were made by a single observer during daylight hours (approximately 1300 to 0300 Coordinated Universal Time [UTC]) throughout the cruise, conditions permitting (e.g., clear or high clouds, beaufort state less than 4, etc.). Observations were made from the 04-deck (above the Bridge), where eye height was approximately 20 meters above the sea surface, using handheld Fujinon 7 x 50 binoculars with compass for bearing and reticle for distance. Observations were recorded on a laptop computer using the marine mammal and bird mapping program *Seebird*. This program interfaces with handheld global positioning system (GPS) devices, and allows the generation of observation logs containing the observations of the mammals themselves with matching ship's velocities and positions, observational conditions, etc. Generally, intensive "on effort" observations were made during the last half of each half-hour period, with the other half of the half-hour period devoted to less intensive "off effort" observations. Depending on the situation, the observer would take short breaks from the observations approximately every two hours.

### *Ancillary Observations:*

*Underway Data:* Near surface measurements of temperature and salinity were recorded throughout the cruise from water pumped through the ship's uncontaminated seawater system. These data, along with meteorological data (barometric pressure, wind, etc.) collected from various sensors mounted primarily on the ship's mast, were recorded at approximately 30-second intervals throughout the cruise. Table 1 lists these data at the start of each hydrographic station.

## **Tabulated Data**

The following tables of data follow:

1) *Table 1: Meteorological and Sea Surface Data*

This lists the meteorological and surface oceanographic conditions at the start of each hydrographic station.

2) *Table 2: Hydrographic Data*

This is a chronological listing of the hydrographic data collected at each CTD station during the cruise. Data are given for standard pressures, except that the last line of data for each site is the deepest pressure for that CTD cast. The surface pressure, listed as 0 dbar, is actually 2 dbar. Salinities have been adjusted according to the conductivity/salinity calibration correction determined from the collected salinity water samples. The time listed for each station is the beginning (UTC) of the CTD cast. Units of geopotential anomaly ( $\Delta\Phi$ ), potential density ( $\sigma_\theta$ ), and potential spiciness ( $\pi_\theta$ ) are  $\text{m}^2\text{s}^{-2}$ ,  $\text{kg m}^{-3}$ , and  $\text{kg m}^{-3}$ , respectively.

3) Table 3: Nutrient and Primary Productivity Data

This is a chronological listing of the results of the nutrient and primary productivity analyses of the water samples collected from the 12 Niskin bottles tripped at each hydrographic station. The time given is the start (UTC) for each hydrographic station. Except where primary productivity analyses were not performed (see Introduction), the data for each hydrographic station are separated into two sections (“Physical and Chemical” and “Biological”).

The physical oceanographic properties listed in the first seven columns of the “Physical and Chemical” section of each station’s data are the uncorrected values measured by the CTD at the times each Niskin bottle was tripped. Because they are uncorrected, these values may differ slightly from those listed in Table 1. The last four columns of this section of each station’s data give the nitrate ( $\text{NO}_3$ ), nitrite ( $\text{NO}_2$ ), phosphate ( $\text{PO}_4$ ), and dissolved silicate ( $\text{SiO}_4$ ) concentrations (determined as described previously).

The “Biological” section of each station’s data gives the results of the primary productivity analyses. As stated above, primary productivity sampling was not undertaken at every hydrographic station.

4) Table 4: Zooplankton Data

Twenty hydrographic stations—10 on CalCOFI line 67, 10 on CalCOFI line 60—were sampled for zooplankton. This table lists the total biovolume and krill abundance measured. The data are listed by CalCOFI line, onshore to offshore and south to north.

5) Table 5: Marine Mammal Data

This table lists the results of the marine mammal observations made during the cruise. The data are listed by species code, then chronologically within each species code.

## **Figures of Results**

Graphical representations of the data collected during this cruise follow the tabulated data. Figure 3 is a series of four diagrams contouring (a) the temperature ( $^{\circ}\text{C}$ ), (b) the salinity, (c) the density anomaly ( $\text{kg m}^{-3}$ ), and (d) the oxygen ( $\mu\text{m kg}^{-1}$ ) fields along the line of hydrographic stations from Moss Landing to Point Reyes. The two dashed blue lines in each diagram indicate the locations of the corner hydrographic stations (CTDs 20-23 and 27).

Figure 4 contours the fluorescence and transmissivity in the upper 100 meters of the water column along the line of hydrographic stations from Moss Landing to Point Reyes. Again, the dashed blue lines indicate the locations of the corner hydrographic stations.

Figure 5 is a series of four diagrams contouring (a) the nitrate ( $\mu\text{m}$ ), (b) nitrite ( $\mu\text{m}$ ), (c) phosphate ( $\mu\text{m}$ ), and (d) silicate ( $\mu\text{m}$ ) fields along CalCOFI line 67 from Moss Landing to station 67-90.

Figure 6 charts the locations of marine mammal sightings, as well as showing the observational conditions throughout the cruise.

Finally, figures 7 and 8 show interesting trends in the zooplankton biovolume displacement and krill abundance data sets with respect to previous summer cruises in 2004 and 2005.

### Cruise Participants

Personnel	Duties	Institutional Affiliation
Curtis Collins Tarry Rago Katherine Whitaker	Physical Oceanography Physical Oceanography Marine Mammal Obs.	Naval Postgraduate School
Tim Pennington (Chief Sci.) Gernot Friederich Marguerite Blum Erich Reinecker Doug Conlon John Pennington	Nutrients, Primary Prod. Oxygens Nutrients, Primary Prod. Nutrients Physical Oceanography Nutrients	Monterey Bay Aquarium Research Institute
Asila Ghoul Joy Featherstone	Phytoplankton Net Tows Phytoplankton Net Tows	Univ. of CA at Santa Cruz
Jennifer Hughes Martiny Adam Martiny	Biological Oceanography Biological Oceanography	Brown University

### Literature Cited

Chavez, F. P., R. T. Barber, A. Huyer, P. M. Kosro, S. R. Ramp, T. Stanton, and B. Rojas de Mendiola, Horizontal advection and the distribution of nutrients in the coastal transition zone off northern California: effects on primary production, phytoplankton biomass and species composition, *J. Geophys. Res.*, 96, 14833-14848, 1991.

Collins, C. A., J. T. Pennington, C. G. Castro, T. A. Rago, and F.P. Chavez, The California Current system off Monterey, California: physical and biological coupling, *Deep-Sea Res. II*, 50, 2389-2404, 2003.

Holm-Hansen, O., C. J. Lorenzen, R. W. Holmes, and J. D. H. Strickland, Fluorometric determination of chlorophyll, *J. Cons. Perm. Int. Explor. Mer*, 30, 3-15, 1965.

Kramer, D., M. J. Kalin, E. G. Stevens, J. R. Thrailkill, and J. R. Zweifel, Collecting and processing data on fish eggs and larvae in the California Current region, *NOAA Tech. Rep. NMFS CIRC-370*, 38 pp., Seattle, WA, 1972.

Owens, W. B., and R. C. Millard Jr., A new algorithm for CTD oxygen calibration, *J. Phys. Oceanogr.*, 15, 621-631, 1985.

Parsons, T. R., Y. Maita, and C. M. Lalli, A manual of chemical and biological methods for seawater analysis, 173 pp., Pergamon Press, New York, 1984.

Pennington, J. T., and F. P. Chavez, Seasonal fluctuations of temperature, salinity, nitrate, chlorophyll and primary production at station H3/M1 over 1989-1996 in Monterey Bay, California, *Deep-Sea Res. II*, 47, 947-973, 2000.

Sakamoto, C. M., G. E. Friederich, and L. A. Codispoti, MBARI procedures for automated nutrient analyses using a modified Alpkem Series 300 Rapid Flow Analyzer, *MBARI Tech. Rep. No. 90-2*, 84 pp., 1990.

Steger, J. M., F. B. Schwing, C. A. Collins, L. K. Rosenfeld, N. Garfield, and E. Gezgin, The circulation and water masses in the Gulf of the Farallones, *Deep-Sea Res. II*, 47, 907-946, 2000.

UNESCO, Background papers and supporting data on the Practical Salinity Scale, 1978, *UNESCO Tech. Pap. In Mar. Sci.*, No. 37, 1981.

Venrick, E. L., and T. L. Hayward, Determining chlorophyll on the 1984 CalCOFI surveys, *CalCOFI Rep.* 25, 74-78, 1984.

## Tables

**Table 1:** *Meteorological and sea surface data collected during the PaCOOS cruise of June/July 2006.* Listed here are the meteorological and surface oceanographic conditions as measured by the underway data acquisition system of the *NOAA Ship McArthur-II* at the beginning of each hydrographic station. Continuous measurements of the water being pumped through the ship's uncontaminated seawater system ("sea chest") from approximately 3 meters below the surface supplied the oceanographic data, while instrumentation atop the ship's mast supplied the meteorological data.

Station	Yearday, 2006 (UTC)	Barometric Pressure (mb)	Wind Speed (kts)	Wind Direction (°T)	Sea Surface Temperature (°C)	Sea Surface Salinity
1	179.5493	1014.79	3.67	062	12.4711	33.7599
2	179.6410	1015.53	3.77	283	14.1692	33.5410
3	179.7458	1015.71	6.38	042	12.8491	33.6273
4	179.8285	1016.58	6.23	341	14.3528	33.2241
5	179.9417	1016.12	6.86	287	14.2495	33.2838
6	180.0292	1015.60	5.74	326	14.3184	33.1480
7	180.1438	1015.75	6.04	019	14.9440	33.4112
8	180.2313	1016.68	6.15	037	15.1101	33.1021
9	180.3347	1016.82	4.83	297	15.7581	32.8022
10	180.4153	1016.76	5.80	309	15.7747	32.8142
11	180.4910	1017.09	6.82	318	15.9919	32.8327
12	180.5160	1016.99	6.28	333	15.9757	32.8284
13	180.5688	1017.62	6.76	323	16.0287	32.8035
14	180.6556	1018.63	9.42	258	16.3533	32.8435
15	180.7799	1019.23	9.05	281	16.7473	32.8168
16	180.8618	1019.11	10.74	292	17.0314	32.8561
17	180.9667	1019.16	11.84	302	17.0561	32.8284
18	181.0535	1018.77	11.19	302	16.8972	32.8231
19	181.1639	1019.44	14.09	324	16.9454	32.8335
20	181.2514	1020.53	13.21	333	17.0370	32.8275
21	181.2875	1020.27	17.46	040	17.0163	32.8296
22	181.3799	1019.89	11.96	041	17.0065	32.8347
23	181.4153	1019.75	11.75	019	16.8885	32.8327
24	181.5000	1019.80	16.72	346	16.5978	32.8733
25	181.6340	1020.88	16.18	329	16.6711	32.8720
26	181.7813	1021.29	15.41	349	16.5021	32.8717
27	181.9118	1020.82	12.22	344	16.1641	32.7750
28	182.1347	1019.58	16.45	338	16.1200	32.8114
29	182.2757	1019.55	17.42	328	15.8963	32.7829
30	182.4243	1018.20	18.62	324	15.6200	32.7219
31	182.5764	1018.07	21.57	328	15.2372	32.8157
32	182.7347	1018.36	17.75	306	15.1873	32.8026
33	182.8417	1018.07	20.82	351	15.2460	32.8089
34	182.9208	1017.02	21.72	330	15.1216	32.8815
35	183.0257	1015.60	19.67	021	15.2892	33.0312
36	183.1486	1014.82	21.76	356	13.2259	33.1564
37	183.2410	1015.26	20.64	340	12.4689	33.5721
38	183.3097	1014.51	18.11	331	12.3192	33.1671

**Table 2:** *List at standard pressures of hydrographic data collected during the PaCOOS cruise of June/July 2006. Stations are in chronological (and numerical) order. For each cast, the surface pressure (listed as 0 dbar) is actually 2 dbar, while the last pressure is the deepest pressure of the cast. Salinities and oxygens have been adjusted according to the calibration corrections determined from the collected salinity and oxygen water samples. The time listed for each station is the beginning (<mm/dd/yyyy, hhmm> UTC) of the CTD cast. Units of geopotential anomaly ( $\Delta\Phi$ ), potential density ( $\sigma_\theta$ ), and potential spiciness ( $\pi_\theta$ ) are  $\text{m}^2\text{s}^{-2}$ ,  $\text{kg m}^{-3}$ , and  $\text{kg m}^{-3}$ , respectively.*

**Station:** 0   **Date:** 6/27/2006, 2135   **Lat.:** 37° 47.18 N   **Long.:** 122° 23.05 W

P(dbar)	T(°C)	S	O <sub>2</sub> ( $\mu\text{m/kg}$ )	Xmiss(%)	$\Delta\Phi$	$\sigma_\theta$	$\pi_\theta$
0	15.781	27.128	216.9	33.0	0.159	19.749	-4.278
6	15.490	27.577	219.0	22.9	0.464	20.156	-3.923

**Station:** 1   **Date:** 6/28/2006, 1311   **Lat.:** 36° 47.82 N   **Long.:** 121° 50.81 W

P(dbar)	T(°C)	S	O <sub>2</sub> ( $\mu\text{m/kg}$ )	Xmiss(%)	$\Delta\Phi$	$\sigma_\theta$	$\pi_\theta$
0	11.858	33.775	259.6	80.5	0.046	25.664	0.507
10	10.608	33.813	207.0	84.1	0.218	25.921	0.306
20	9.981	33.885	166.5	89.4	0.418	26.085	0.254
30	9.634	33.931	134.8	88.9	0.604	26.179	0.232
50	9.379	33.949	114.4	89.6	0.966	26.235	0.203
75	9.301	33.956	106.0	88.9	1.410	26.253	0.195
100	9.157	33.971	96.1	85.9	1.851	26.289	0.183
125	8.672	34.035	80.9	82.8	2.273	26.416	0.156
150	8.347	34.078	69.5	82.6	2.668	26.500	0.140
200	8.034	34.116	60.0	82.6	3.428	26.577	0.122
222	7.871	34.133	55.4	82.4	3.751	26.615	0.111

Station: 2 Date: 6/28/2006, 1523 Lat.: 36° 44.10 N Long.: 122° 01.11 W

P(dbar)	T(°C)	S	O <sub>2</sub> (μm/kg)	Xmiss(%)	ΔΦ	σ <sub>θ</sub>	π <sub>θ</sub>
0	13.402	33.558	346.3	73.1	0.055	25.196	0.643
10	12.641	33.616	313.1	76.0	0.265	25.392	0.534
20	11.078	33.720	227.1	86.4	0.500	25.765	0.318
30	9.957	33.749	162.5	92.1	0.711	25.983	0.142
50	9.777	33.872	146.5	91.4	1.105	26.110	0.208
75	9.482	33.959	118.8	91.1	1.560	26.227	0.228
100	9.284	33.983	103.3	91.6	2.008	26.278	0.213
125	9.178	34.025	93.0	91.3	2.440	26.328	0.229
150	8.938	34.036	85.9	90.2	2.864	26.375	0.198
200	8.522	34.143	65.5	91.5	3.659	26.525	0.217
250	8.386	34.186	56.9	92.4	4.417	26.580	0.229
300	7.914	34.197	50.7	92.4	5.147	26.661	0.167
400	7.149	34.213	37.8	92.2	6.524	26.784	0.068
500	6.475	34.243	26.9	91.6	7.803	26.900	0.000
600	5.662	34.300	19.5	90.0	8.943	27.048	-0.059
700	5.331	34.326	18.3	89.1	10.003	27.109	-0.078
800	4.831	34.367	15.4	90.6	10.989	27.200	-0.104
900	4.492	34.399	20.1	86.8	11.911	27.263	-0.117
1000	4.186	34.428	22.2	87.7	12.776	27.320	-0.127
1010	4.144	34.431	22.4	88.0	12.860	27.327	-0.129

Station: 3 Date: 6/28/2006, 1754 Lat.: 36° 42.48 N Long.: 122° 14.35 W

P(dbar)	T(°C)	S	O <sub>2</sub> (μm/kg)	Xmiss(%)	ΔΦ	σ <sub>θ</sub>	π <sub>θ</sub>
0	12.234	33.702	294.2	80.7	0.049	25.536	0.521
10	11.230	33.758	239.3	89.3	0.230	25.767	0.375
20	10.837	33.783	217.2	91.7	0.448	25.857	0.323
30	10.215	33.810	170.2	91.9	0.655	25.987	0.235
50	9.338	33.875	108.3	92.1	1.039	26.184	0.138
75	9.051	33.956	93.9	92.0	1.482	26.294	0.155
100	9.057	34.010	93.4	92.2	1.912	26.335	0.198
125	8.930	34.057	84.2	92.3	2.330	26.393	0.214
150	8.713	34.098	77.4	92.4	2.732	26.460	0.212
200	8.459	34.152	66.5	92.6	3.509	26.542	0.214
250	7.934	34.163	56.3	92.6	4.250	26.630	0.143
300	7.578	34.190	47.5	92.8	4.956	26.704	0.112
400	6.872	34.225	32.4	92.8	6.288	26.830	0.039
500	6.215	34.257	21.9	92.6	7.514	26.944	-0.022
600	5.728	34.292	15.8	92.5	8.643	27.033	-0.057
700	5.118	34.341	11.9	92.6	9.695	27.146	-0.092
800	4.696	34.383	12.0	92.7	10.648	27.228	-0.106
900	4.286	34.426	14.9	92.7	11.529	27.307	-0.117
1000	3.910	34.461	20.2	92.4	12.347	27.375	-0.129
1010	3.889	34.463	20.6	92.5	12.426	27.378	-0.129



Station: 4 Date: 6/28/2006, 1953 Lat.: 36° 37.60 N Long.: 122° 25.12 W

P(dbar)	T(°C)	S	O <sub>2</sub> (μm/kg)	Xmiss(%)	ΔΦ	σ <sub>θ</sub>	π <sub>θ</sub>
0	13.937	33.267	327.4	85.1	0.062	24.861	0.525
10	12.177	33.438	255.3	88.2	0.279	25.343	0.302
20	10.796	33.563	211.1	90.5	0.523	25.693	0.141
30	10.203	33.745	183.1	92.0	0.736	25.938	0.181
50	9.492	33.889	121.8	92.0	1.122	26.170	0.174
75	9.310	33.954	102.7	92.0	1.574	26.250	0.195
100	9.251	33.991	94.4	91.8	2.015	26.289	0.214
125	8.970	34.051	85.2	92.2	2.441	26.382	0.216
150	8.858	34.078	79.2	92.2	2.850	26.421	0.219
200	8.646	34.140	67.2	92.4	3.647	26.503	0.234
250	8.358	34.190	55.6	92.6	4.405	26.588	0.228
300	8.015	34.197	51.7	93.0	5.136	26.645	0.181
400	7.121	34.202	40.1	93.1	6.517	26.779	0.055
500	6.396	34.236	25.6	93.1	7.788	26.904	-0.016
600	5.800	34.285	15.8	92.7	8.948	27.019	-0.054
700	5.203	34.342	11.3	92.6	10.005	27.137	-0.081
800	4.883	34.372	10.7	93.0	10.984	27.198	-0.095
900	4.469	34.408	12.4	93.1	11.899	27.273	-0.112
1000	4.096	34.447	16.9	93.1	12.748	27.344	-0.121
1012	4.047	34.451	17.8	93.2	12.846	27.353	-0.123

Station: 5 Date: 6/28/2006, 2236 Lat.: 36° 32.71 N Long.: 122° 35.81 W

P(dbar)	T(°C)	S	O <sub>2</sub> (μm/kg)	Xmiss(%)	ΔΦ	σ <sub>θ</sub>	π <sub>θ</sub>
0	14.178	33.303	286.0	90.4	0.062	24.839	0.605
10	13.918	33.312	293.8	89.5	0.307	24.900	0.557
20	11.921	33.372	286.5	82.9	0.600	25.340	0.200
30	10.938	33.507	214.3	89.8	0.842	25.625	0.122
50	9.974	33.762	147.0	91.8	1.278	25.991	0.155
75	9.217	33.980	108.2	92.0	1.738	26.286	0.200
100	9.042	34.038	93.5	92.1	2.164	26.360	0.218
125	8.955	34.071	82.8	92.0	2.578	26.400	0.229
150	8.838	34.090	76.8	92.1	2.985	26.434	0.225
200	8.583	34.143	66.4	92.4	3.774	26.516	0.226
250	8.280	34.172	58.6	92.5	4.534	26.585	0.202
300	7.883	34.219	46.6	92.9	5.259	26.682	0.179
400	7.119	34.227	34.9	92.8	6.615	26.798	0.075
500	6.318	34.252	23.1	92.6	7.862	26.926	-0.014
600	5.686	34.296	14.6	92.6	9.006	27.042	-0.059
700	5.216	34.342	11.5	92.6	10.067	27.135	-0.080
800	4.689	34.391	11.8	92.7	11.023	27.235	-0.101
900	4.430	34.417	13.4	92.5	11.916	27.284	-0.109
1000	4.173	34.443	16.2	92.7	12.772	27.333	-0.117
1012	4.144	34.445	16.7	92.6	12.871	27.338	-0.118

Station: 6 Date: 6/29/2006, 0042 Lat.: 36° 27.61 N Long.: 122° 46.60 W

P(dbar)	T(°C)	S	O <sub>2</sub> (μm/kg)	Xmiss(%)	ΔΦ	σ <sub>θ</sub>	π <sub>θ</sub>
0	14.966	33.182	288.8	91.1	0.067	24.578	0.682
10	12.416	33.266	250.0	90.7	0.318	25.164	0.212
20	11.110	33.228	224.1	91.4	0.583	25.377	-0.068
30	10.691	33.399	188.1	92.0	0.833	25.584	-0.008
50	10.097	33.722	175.1	91.8	1.270	25.939	0.144
75	9.928	33.856	162.1	91.4	1.769	26.073	0.221
100	9.346	33.917	117.4	91.8	2.242	26.216	0.171
125	8.984	33.976	101.9	92.1	2.683	26.321	0.159
150	8.805	34.041	88.6	92.3	3.102	26.400	0.181
200	8.372	34.112	75.6	92.7	3.896	26.524	0.169
250	8.121	34.206	51.3	93.0	4.639	26.636	0.205
300	7.745	34.214	45.8	93.0	5.345	26.698	0.155
400	6.786	34.215	33.3	92.9	6.663	26.835	0.021
500	6.135	34.263	20.3	92.8	7.871	26.959	-0.028
600	5.513	34.310	13.4	92.7	8.979	27.074	-0.069
700	5.053	34.353	11.1	92.7	9.992	27.163	-0.089
800	4.607	34.397	12.2	92.8	10.926	27.248	-0.105
900	4.311	34.428	14.7	92.9	11.796	27.306	-0.113
1000	4.071	34.451	18.2	93.0	12.626	27.350	-0.120
1010	4.051	34.453	18.5	93.1	12.707	27.354	-0.121

Station: 7 Date: 6/29/2006, 0327 Lat.: 36° 22.55 N Long.: 122° 57.28 W

P(dbar)	T(°C)	S	O <sub>2</sub> (μm/kg)	Xmiss(%)	ΔΦ	σ <sub>θ</sub>	π <sub>θ</sub>
0	15.014	33.410	278.7	90.1	0.064	24.744	0.873
10	14.645	33.423	278.3	90.2	0.316	24.833	0.801
20	11.435	33.495	212.2	91.4	0.581	25.526	0.205
30	10.345	33.573	167.6	92.3	0.811	25.780	0.069
50	9.848	33.816	145.6	92.2	1.224	26.054	0.176
75	9.552	33.952	124.5	91.7	1.694	26.210	0.233
100	9.176	33.975	104.5	92.0	2.137	26.289	0.189
125	8.823	34.017	94.6	92.2	2.563	26.378	0.166
150	8.749	34.084	84.9	92.5	2.972	26.443	0.207
200	8.192	34.136	69.5	92.8	3.743	26.569	0.161
250	7.639	34.149	61.4	93.0	4.467	26.662	0.089
300	7.247	34.179	45.4	93.0	5.154	26.742	0.056
400	6.382	34.198	32.1	93.1	6.432	26.874	-0.047
500	5.944	34.266	18.7	93.1	7.607	26.985	-0.050
600	5.418	34.305	12.9	93.1	8.691	27.081	-0.084
700	4.997	34.350	10.7	93.1	9.699	27.166	-0.098
800	4.660	34.394	11.7	93.1	10.639	27.240	-0.102
900	4.282	34.430	14.9	93.1	11.518	27.310	-0.115
1000	3.998	34.459	19.0	93.2	12.338	27.363	-0.122
1010	3.982	34.459	19.3	93.1	12.418	27.366	-0.123

Station: 8 Date: 6/29/2006, 0533 Lat.: 36° 17.58 N Long.: 123° 07.86 W

P(dbar)	T(°C)	S	O <sub>2</sub> (μm/kg)	Xmiss(%)	ΔΦ	σ <sub>θ</sub>	π <sub>θ</sub>
0	14.869	33.116	302.2	90.1	0.068	24.548	0.608
10	12.901	33.135	287.9	87.7	0.328	24.968	0.205
20	11.019	33.174	232.6	90.6	0.602	25.351	-0.127
30	11.093	33.428	204.0	91.5	0.856	25.536	0.088
50	10.122	33.602	146.4	92.2	1.313	25.841	0.053
75	9.851	33.760	142.3	92.1	1.835	26.010	0.132
100	9.406	33.894	114.5	91.9	2.311	26.189	0.163
125	9.135	33.968	102.2	91.9	2.759	26.290	0.177
150	8.869	34.030	90.3	92.4	3.187	26.381	0.183
200	8.409	34.127	72.6	92.8	3.986	26.530	0.187
250	7.933	34.162	60.6	93.0	4.730	26.629	0.142
300	7.494	34.186	49.0	93.1	5.433	26.713	0.097
400	6.326	34.190	32.3	93.0	6.732	26.876	-0.060
500	5.820	34.271	17.3	93.1	7.896	27.005	-0.061
600	5.289	34.324	11.7	93.2	8.961	27.112	-0.084
700	4.812	34.373	10.8	93.1	9.931	27.206	-0.101
800	4.473	34.412	13.0	93.1	10.837	27.275	-0.108
900	4.164	34.442	16.5	93.2	11.683	27.332	-0.117
1000	3.898	34.468	20.8	93.2	12.485	27.381	-0.125
1011	3.881	34.470	21.5	93.2	12.571	27.385	-0.125

Station: 9 Date: 6/29/2006, 0802 Lat.: 36° 12.54 N Long.: 123° 18.62 W

P(dbar)	T(°C)	S	O <sub>2</sub> (μm/kg)	Xmiss(%)	ΔΦ	σ <sub>θ</sub>	π <sub>θ</sub>
0	15.574	32.816	269.7	90.6	0.075	24.164	0.530
10	15.500	32.822	270.7	90.5	0.374	24.185	0.517
20	14.625	32.831	276.5	90.5	0.736	24.381	0.327
30	14.444	32.836	272.8	90.2	1.088	24.424	0.291
50	12.204	33.171	252.9	90.2	1.723	25.132	0.094
75	9.924	33.454	176.5	92.4	2.345	25.759	-0.099
100	9.261	33.804	133.9	92.6	2.858	26.142	0.068
125	9.177	33.970	99.9	92.6	3.310	26.285	0.185
150	8.797	34.027	87.4	92.6	3.736	26.391	0.169
200	8.179	34.100	73.2	92.8	4.526	26.543	0.131
250	7.391	34.065	76.8	93.0	5.267	26.631	-0.013
300	6.909	34.082	65.8	93.1	5.968	26.712	-0.067
400	6.152	34.159	37.8	93.1	7.257	26.873	-0.107
500	5.510	34.206	23.6	93.2	8.434	26.991	-0.150
600	5.204	34.290	12.5	93.2	9.506	27.094	-0.121
700	4.820	34.351	10.2	93.2	10.494	27.188	-0.117
800	4.529	34.395	11.5	93.2	11.411	27.255	-0.115
900	4.233	34.432	14.7	93.2	12.276	27.317	-0.118
1000	3.954	34.456	18.4	93.1	13.092	27.366	-0.128
1012	3.926	34.459	18.9	93.1	13.187	27.371	-0.129

Station: 10 Date: 6/29/2006, 0958 Lat.: 36° 07.56 N Long.: 123° 29.43 W

P(dbar)	T(°C)	S	O <sub>2</sub> (μm/kg)	Xmiss(%)	ΔΦ	σ <sub>θ</sub>	π <sub>θ</sub>
0	15.569	32.828	267.9	91.3	0.075	24.174	0.538
10	15.546	32.826	268.4	91.3	0.373	24.177	0.530
20	14.663	32.832	278.7	90.2	0.737	24.374	0.336
30	14.388	32.815	275.5	90.5	1.089	24.419	0.262
50	12.042	32.718	272.4	91.5	1.774	24.811	-0.300
75	10.485	33.253	219.3	91.7	2.483	25.507	-0.162
100	9.964	33.607	174.7	92.4	3.056	25.872	0.029
125	9.258	33.760	144.1	92.7	3.560	26.108	0.032
150	8.952	33.853	139.5	92.7	4.023	26.230	0.056
200	8.479	34.000	89.9	92.8	4.876	26.419	0.097
250	7.983	34.090	72.7	92.9	5.656	26.565	0.093
300	7.379	34.096	69.2	93.0	6.387	26.658	0.009
400	6.487	34.150	41.8	93.0	7.732	26.823	-0.071
500	5.774	34.214	23.2	93.1	8.937	26.965	-0.112
600	5.061	34.266	13.2	93.2	10.024	27.092	-0.156
700	4.796	34.336	9.9	93.2	11.015	27.178	-0.132
800	4.537	34.380	10.2	93.2	11.948	27.243	-0.126
900	4.269	34.413	12.2	93.2	12.827	27.298	-0.129
1000	3.980	34.447	16.1	93.2	13.656	27.356	-0.133
1012	3.939	34.452	17.0	93.2	13.752	27.364	-0.133

Station: 11 Date: 6/29/2006, 1147 Lat.: 36° 07.58 N Long.: 123° 29.51 W

P(dbar)	T(°C)	S	O <sub>2</sub> (μm/kg)	Xmiss(%)	ΔΦ	σ <sub>θ</sub>	π <sub>θ</sub>
0	15.766	32.847	263.1	91.0	0.075	24.145	0.598
10	15.566	32.836	263.3	91.2	0.375	24.181	0.543
20	14.633	32.816	267.8	91.1	0.742	24.368	0.317
30	14.498	32.867	269.4	90.4	1.094	24.436	0.328
50	13.778	32.840	265.7	90.8	1.788	24.566	0.151
75	10.806	32.958	236.6	92.3	2.544	25.221	-0.341
100	10.021	33.523	179.9	92.5	3.149	25.797	-0.028
101	10.002	33.527	176.9	92.4	3.171	25.803	-0.028

Station: 12 Date: 6/29/2006, 1223 Lat.: 36° 07.14 N Long.: 123° 30.22 W

P(dbar)	T(°C)	S	O <sub>2</sub> (μm/kg)	Xmiss(%)	ΔΦ	σ <sub>θ</sub>	π <sub>θ</sub>
0	15.783	32.849	265.0	91.4	0.075	24.142	0.603
10	15.603	32.837	262.7	91.3	0.376	24.174	0.553
20	14.552	32.800	269.6	90.9	0.741	24.373	0.286
30	14.508	32.859	271.2	90.5	1.093	24.428	0.323
50	13.441	32.845	264.2	91.2	1.785	24.638	0.084
75	10.326	33.333	219.2	92.0	2.506	25.518	-0.127
100	9.922	33.681	163.8	92.5	3.064	25.937	0.081
101	9.732	33.664	150.8	92.5	3.085	25.955	0.035

Station: 13 Date: 6/29/2006, 1339 Lat.: 36° 02.59 N Long.: 123° 40.09 W

P(dbar)	T(°C)	S	O <sub>2</sub> (μm/kg)	Xmiss(%)	ΔΦ	σ <sub>θ</sub>	π <sub>θ</sub>
0	15.776	32.820	262.6	91.2	0.076	24.122	0.579
10	15.423	32.847	268.9	90.8	0.377	24.221	0.519
20	14.657	32.841	274.3	90.6	0.736	24.382	0.342
30	14.459	32.834	272.9	90.1	1.088	24.419	0.293
50	12.303	32.729	266.6	91.6	1.776	24.770	-0.240
75	10.704	33.086	235.8	92.3	2.498	25.339	-0.256
100	10.621	33.410	222.9	92.4	3.124	25.606	-0.013
125	9.561	33.715	142.1	92.6	3.664	26.024	0.047
150	9.089	33.854	135.3	92.7	4.139	26.209	0.079
200	8.479	33.996	109.4	92.8	5.000	26.416	0.094
250	8.159	34.090	79.5	92.8	5.791	26.539	0.119
300	7.665	34.124	66.3	92.9	6.533	26.639	0.072
400	6.665	34.165	41.6	93.0	7.898	26.811	-0.035
500	5.902	34.202	26.1	93.1	9.130	26.940	-0.106
600	5.339	34.273	14.4	93.1	10.244	27.065	-0.119
700	4.839	34.324	10.4	93.1	11.261	27.164	-0.136
800	4.621	34.387	10.9	93.1	12.199	27.239	-0.112
900	4.174	34.419	12.9	93.2	13.072	27.313	-0.134
1000	3.928	34.450	17.3	93.2	13.890	27.364	-0.136
1012	3.847	34.450	17.1	93.2	13.986	27.372	-0.144

Station: 14 Date: 6/29/2006, 1544 Lat.: 35° 57.58 N Long.: 123° 50.58 W

P(dbar)	T(°C)	S	O <sub>2</sub> (μm/kg)	Xmiss(%)	ΔΦ	σ <sub>θ</sub>	π <sub>θ</sub>
0	16.189	32.872	262.5	91.3	0.077	24.068	0.716
10	16.037	32.848	261.6	91.5	0.383	24.085	0.661
20	14.881	32.891	272.9	90.9	0.753	24.373	0.432
30	14.005	32.907	272.6	90.7	1.095	24.570	0.253
50	12.229	32.850	259.7	91.5	1.754	24.878	-0.158
75	10.554	33.420	172.7	92.1	2.427	25.625	-0.017
100	9.917	33.702	129.0	92.4	2.973	25.954	0.096
125	9.171	33.790	124.6	92.7	3.467	26.146	0.042
150	9.319	33.958	93.1	92.5	3.923	26.254	0.199
200	8.747	34.058	77.7	92.6	4.774	26.424	0.185
250	8.214	34.104	73.9	92.7	5.564	26.542	0.138
300	7.649	34.114	68.7	92.9	6.307	26.634	0.062
400	6.668	34.160	42.2	93.0	7.674	26.807	-0.039
500	5.969	34.201	27.0	93.1	8.904	26.931	-0.098
600	5.412	34.266	15.2	93.1	10.033	27.051	-0.116
700	4.961	34.336	10.5	93.1	11.058	27.159	-0.113
800	4.577	34.386	11.0	93.2	11.997	27.243	-0.117
900	4.305	34.422	13.6	93.2	12.875	27.302	-0.118
1000	3.972	34.453	17.4	93.1	13.701	27.361	-0.129
1012	3.935	34.455	18.3	93.1	13.797	27.367	-0.131

Station: 15 Date: 6/29/2006, 1843 Lat.: 35° 52.64 N Long.: 124° 01.00 W

P(dbar)	T(°C)	S	O <sub>2</sub> (μm/kg)	Xmiss(%)	ΔΦ	σ <sub>θ</sub>	π <sub>θ</sub>
0	16.445	32.831	258.2	92.3	0.078	23.979	0.745
10	16.223	32.852	261.2	92.0	0.391	24.046	0.708
20	15.052	32.884	275.1	91.6	0.755	24.330	0.464
30	14.845	32.877	270.1	91.3	1.113	24.370	0.413
50	14.084	32.889	262.6	91.3	1.812	24.540	0.255
75	11.245	33.233	210.6	92.2	2.557	25.357	-0.040
100	10.025	33.638	138.6	92.5	3.132	25.886	0.064
125	9.652	33.821	113.8	92.5	3.633	26.092	0.145
150	9.440	33.924	97.3	92.5	4.104	26.207	0.191
200	8.880	34.043	80.7	92.7	4.973	26.391	0.194
250	8.172	34.087	76.5	92.8	5.773	26.535	0.119
300	7.752	34.102	70.4	92.9	6.524	26.610	0.068
400	6.200	34.073	61.0	93.0	7.906	26.799	-0.169
500	5.865	34.188	28.7	93.1	9.138	26.934	-0.121
600	5.387	34.269	14.6	93.1	10.259	27.056	-0.116
700	4.956	34.343	10.4	93.2	11.279	27.166	-0.108
800	4.583	34.392	11.3	93.2	12.214	27.247	-0.111
900	4.220	34.428	14.3	93.1	13.084	27.316	-0.122
1000	3.927	34.454	17.8	93.1	13.901	27.367	-0.132
1012	3.890	34.457	18.1	93.1	13.996	27.373	-0.134

Station: 16 Date: 6/29/2006, 2041 Lat.: 35° 47.66 N Long.: 124° 11.80 W

P(dbar)	T(°C)	S	O <sub>2</sub> (μm/kg)	Xmiss(%)	ΔΦ	σ <sub>θ</sub>	π <sub>θ</sub>
0	16.732	32.870	259.4	91.0	0.079	23.943	0.844
10	16.500	32.868	259.4	90.9	0.394	23.994	0.786
20	15.725	32.848	264.8	91.1	0.774	24.155	0.589
30	15.473	32.844	265.0	91.0	1.147	24.208	0.527
50	14.658	32.852	263.2	91.4	1.875	24.392	0.351
75	12.369	33.094	244.2	92.2	2.655	25.041	0.064
100	11.303	33.452	212.6	92.7	3.320	25.518	0.144
125	10.232	33.690	175.0	92.7	3.896	25.892	0.141
150	9.357	33.789	135.1	92.5	4.397	26.115	0.071
200	8.420	33.967	134.5	92.8	5.273	26.402	0.062
250	7.771	33.993	130.2	93.1	6.069	26.520	-0.016
300	7.248	34.034	95.4	93.1	6.820	26.627	-0.058
400	6.471	34.109	53.0	93.1	8.192	26.793	-0.105
500	5.841	34.196	26.4	93.1	9.426	26.942	-0.118
600	5.365	34.284	13.8	93.1	10.536	27.071	-0.107
700	4.983	34.341	10.6	93.2	11.550	27.161	-0.107
800	4.661	34.380	11.0	93.2	12.497	27.229	-0.113
900	4.277	34.432	15.1	93.2	13.382	27.312	-0.114
1000	3.838	34.471	21.2	93.2	14.179	27.389	-0.128
1012	3.809	34.473	21.7	93.2	14.272	27.394	-0.129

Station: 17 Date: 6/29/2006, 2312 Lat.: 35° 42.53 N Long.: 124° 22.57 W

P(dbar)	T(°C)	S	O <sub>2</sub> (μm/kg)	Xmiss(%)	ΔΦ	σ <sub>θ</sub>	π <sub>θ</sub>
0	16.913	32.844	256.7	91.3	0.080	23.880	0.867
10	16.895	32.845	256.2	91.3	0.402	23.886	0.863
20	15.622	32.833	263.7	90.9	0.782	24.167	0.553
30	15.406	32.850	263.7	90.8	1.153	24.227	0.517
50	13.381	32.994	253.5	91.9	1.852	24.765	0.190
75	12.349	33.255	243.7	92.8	2.598	25.169	0.188
100	11.369	33.486	214.7	92.7	3.264	25.532	0.184
125	10.200	33.612	165.1	92.6	3.834	25.837	0.073
150	9.663	33.784	134.8	92.4	4.347	26.061	0.117
200	8.775	33.988	115.6	92.7	5.247	26.364	0.134
250	8.349	34.097	83.7	92.8	6.054	26.516	0.153
300	7.241	34.027	101.7	93.2	6.809	26.623	-0.065
400	6.309	34.125	46.8	93.1	8.163	26.826	-0.114
500	5.806	34.202	25.5	93.1	9.378	26.951	-0.118
600	5.327	34.291	13.2	93.1	10.476	27.081	-0.106
700	4.891	34.343	10.5	93.1	11.482	27.173	-0.115
800	4.511	34.388	11.0	93.1	12.412	27.251	-0.123
900	4.143	34.422	13.1	93.2	13.275	27.319	-0.135
1000	3.842	34.456	18.1	93.2	14.082	27.378	-0.139
1011	3.836	34.459	18.6	93.2	14.168	27.380	-0.138

Station: 18 Date: 6/30/2006, 0117 Lat.: 35° 37.58 N Long.: 124° 33.14 W

P(dbar)	T(°C)	S	O <sub>2</sub> (μm/kg)	Xmiss(%)	ΔΦ	σ <sub>θ</sub>	π <sub>θ</sub>
0	16.946	32.842	257.6	91.6	0.080	23.871	0.873
10	16.914	32.841	257.6	91.6	0.402	23.878	0.864
20	15.765	32.833	263.8	91.1	0.784	24.135	0.586
30	15.721	32.835	263.4	91.1	1.161	24.146	0.577
50	14.200	32.871	257.3	91.8	1.892	24.502	0.265
75	12.691	33.128	245.8	92.9	2.682	25.005	0.155
100	12.007	33.326	233.4	92.8	3.385	25.290	0.177
125	10.795	33.505	196.5	92.7	4.010	25.650	0.093
150	10.054	33.643	159.5	92.5	4.572	25.886	0.072
200	8.551	33.912	163.8	92.9	5.518	26.339	0.038
250	8.083	34.049	101.5	92.9	6.328	26.518	0.075
300	7.089	34.028	97.6	93.1	7.072	26.645	-0.085
400	6.002	34.054	63.4	93.2	8.422	26.809	-0.209
500	5.587	34.186	26.9	93.1	9.631	26.966	-0.157
600	5.240	34.285	13.5	93.1	10.726	27.086	-0.121
700	4.835	34.357	10.6	93.1	11.717	27.191	-0.110
800	4.507	34.391	11.4	93.1	12.637	27.254	-0.121
900	4.215	34.425	13.9	93.1	13.502	27.314	-0.125
1000	3.884	34.455	17.6	93.1	14.318	27.372	-0.136
1011	3.867	34.456	18.1	93.1	14.404	27.374	-0.137

Station: 19 Date: 6/30/2006, 0356 Lat.: 35° 32.63 N Long.: 124° 43.76 W

P(dbar)	T(°C)	S	O <sub>2</sub> (μm/kg)	Xmiss(%)	ΔΦ	σ <sub>θ</sub>	π <sub>θ</sub>
0	16.745	32.847	259.1	91.6	0.080	23.922	0.829
10	16.189	32.837	262.0	91.6	0.395	24.042	0.689
20	15.859	32.826	263.9	91.7	0.779	24.108	0.603
30	15.660	32.823	262.8	91.6	1.157	24.150	0.553
50	14.760	32.856	258.1	91.6	1.902	24.373	0.376
75	12.746	33.108	246.8	92.8	2.686	24.979	0.150
100	11.455	33.388	219.7	92.8	3.384	25.441	0.122
125	10.713	33.598	193.7	92.7	3.983	25.737	0.152
150	9.849	33.742	146.8	92.5	4.523	25.998	0.116
200	8.733	33.882	151.1	92.7	5.462	26.288	0.043
250	8.266	34.003	122.8	92.8	6.300	26.455	0.066
300	7.291	34.016	113.4	93.2	7.066	26.607	-0.067
400	6.158	34.078	58.6	93.2	8.440	26.809	-0.170
500	5.565	34.176	27.9	93.2	9.652	26.960	-0.167
600	5.307	34.284	13.9	93.2	10.749	27.078	-0.113
700	4.895	34.346	10.6	93.1	11.754	27.175	-0.113
800	4.532	34.393	11.4	93.1	12.682	27.254	-0.116
900	4.159	34.422	13.3	93.2	13.547	27.317	-0.134
1000	3.860	34.457	18.3	93.2	14.354	27.376	-0.137
1012	3.835	34.461	19.0	93.1	14.448	27.382	-0.136

Station: 20 Date: 6/30/2006, 0602 Lat.: 35° 27.69 N Long.: 124° 54.45 W

P(dbar)	T(°C)	S	O <sub>2</sub> (μm/kg)	Xmiss(%)	ΔΦ	σ <sub>θ</sub>	π <sub>θ</sub>
0	16.820	32.842	258.1	91.7	0.080	23.900	0.843
10	16.787	32.842	257.9	91.7	0.400	23.908	0.834
20	15.661	32.813	264.4	91.4	0.783	24.142	0.546
30	15.348	32.782	265.8	91.5	1.158	24.188	0.450
50	13.535	32.900	267.1	90.9	1.868	24.661	0.147
75	12.423	33.230	243.5	92.6	2.629	25.136	0.183
100	10.954	33.530	198.9	92.6	3.269	25.641	0.142
125	9.986	33.696	156.1	92.5	3.818	25.938	0.103
150	8.894	33.786	159.4	92.7	4.307	26.187	-0.007
200	8.237	33.959	141.1	93.0	5.168	26.424	0.028
204	8.226	33.982	136.7	93.0	5.233	26.444	0.044



Station: 21 Date: 6/30/2006, 0654 Lat.: 35° 27.46 N Long.: 124° 54.60 W

P(dbar)	T(°C)	S	O <sub>2</sub> (μm/kg)	Xmiss(%)	ΔΦ	σ <sub>θ</sub>	π <sub>θ</sub>
0	16.805	32.845	257.2	91.7	0.080	23.906	0.841
10	16.678	32.844	257.1	91.7	0.399	23.936	0.810
20	15.677	32.809	264.5	91.5	0.782	24.136	0.547
30	15.419	32.814	265.1	91.3	1.157	24.197	0.491
50	13.508	32.946	260.9	90.9	1.850	24.702	0.178
75	12.466	33.193	242.9	92.4	2.608	25.099	0.162
100	11.109	33.529	207.7	92.7	3.247	25.613	0.170
125	9.987	33.698	154.6	92.5	3.803	25.940	0.105
150	8.995	33.775	151.8	92.6	4.296	26.162	0.001
200	8.234	33.980	138.5	93.0	5.154	26.441	0.044
250	7.658	34.030	103.6	93.1	5.932	26.566	-0.002
300	7.242	34.073	76.4	93.1	6.659	26.659	-0.028
400	5.905	34.055	63.8	93.2	8.002	26.822	-0.220
500	5.253	34.133	33.1	93.2	9.206	26.964	-0.238
600	5.041	34.265	13.8	93.2	10.290	27.093	-0.159
700	4.814	34.364	10.8	93.2	11.272	27.198	-0.108
800	4.455	34.403	12.3	93.1	12.177	27.270	-0.116
900	4.100	34.438	15.6	93.1	13.025	27.335	-0.127
1000	3.791	34.463	19.2	93.2	13.820	27.388	-0.139
1100	3.546	34.490	25.2	93.2	14.569	27.434	-0.142
1200	3.334	34.512	31.0	93.2	15.282	27.473	-0.145
1300	3.136	34.529	36.0	93.2	15.963	27.505	-0.151
1400	2.957	34.542	40.9	93.2	16.617	27.532	-0.157
1500	2.805	34.554	45.2	93.2	17.250	27.556	-0.161
1750	2.413	34.587	59.5	93.2	18.732	27.617	-0.170
2000	2.124	34.614	75.2	93.2	20.084	27.663	-0.173
2500	1.813	34.646	98.6	93.2	22.569	27.716	-0.174
2534	1.792	34.646	100.0	93.2	22.732	27.718	-0.175

Station: 22 Date: 6/30/2006, 0907 Lat.: 35° 27.52 N Long.: 124° 54.42 W

P(dbar)	T(°C)	S	O <sub>2</sub> (μm/kg)	Xmiss(%)	ΔΦ	σ <sub>θ</sub>	π <sub>θ</sub>
0	16.796	32.849	257.0	91.9	0.080	23.912	0.843
10	16.776	32.849	257.0	91.9	0.399	23.916	0.837
20	15.819	32.834	262.7	92.0	0.783	24.123	0.599
30	15.595	32.829	264.3	91.8	1.160	24.170	0.544
50	13.597	32.760	277.5	91.7	1.887	24.541	0.048
75	12.446	33.164	244.7	92.5	2.654	25.081	0.135
100	11.164	33.458	205.2	92.7	3.318	25.547	0.123
102	11.129	33.477	203.8	92.6	3.367	25.569	0.132

Station: 23 Date: 6/30/2006, 0958 Lat.: 35° 28.19 N Long.: 124° 55.87 W

P(dbar)	T(°C)	S	O <sub>2</sub> (μm/kg)	Xmiss(%)	ΔΦ	σ <sub>θ</sub>	π <sub>θ</sub>
0	16.670	32.847	258.3	91.8	0.079	23.939	0.811
10	16.620	32.845	258.4	91.8	0.396	23.950	0.797
20	15.586	32.796	265.3	91.7	0.780	24.146	0.516
30	15.508	32.859	264.1	91.5	1.153	24.212	0.547
50	13.403	32.958	259.7	91.1	1.853	24.733	0.166
75	12.323	33.243	239.7	92.6	2.598	25.165	0.174
100	11.332	33.504	219.5	92.7	3.246	25.553	0.191
101	11.300	33.510	218.7	92.7	3.270	25.563	0.189

Station: 24 Date: 6/30/2006, 1200 Lat.: 35° 42.29 N Long.: 125° 05.36 W

P(dbar)	T(°C)	S	O <sub>2</sub> (μm/kg)	Xmiss(%)	ΔΦ	σ <sub>θ</sub>	π <sub>θ</sub>
0	16.376	32.888	260.3	91.9	0.077	24.038	0.773
10	16.327	32.887	260.7	91.9	0.386	24.049	0.761
20	15.465	32.879	266.6	91.4	0.759	24.237	0.554
30	15.244	32.915	267.8	91.3	1.123	24.313	0.532
50	13.845	32.821	268.2	92.3	1.834	24.537	0.150
75	13.031	33.197	253.8	92.6	2.633	24.992	0.279
100	10.523	33.433	178.7	92.8	3.296	25.641	-0.012
125	9.339	33.623	160.8	92.8	3.841	25.988	-0.064
150	9.148	33.884	115.3	92.8	4.318	26.223	0.112
200	8.457	33.989	126.8	92.9	5.179	26.414	0.085
250	7.613	34.003	119.9	93.1	5.968	26.551	-0.030
300	6.908	34.020	96.6	93.1	6.701	26.663	-0.116
400	6.361	34.126	46.3	93.1	8.037	26.821	-0.106
500	5.832	34.214	24.2	93.1	9.249	26.958	-0.105
600	5.189	34.255	15.1	93.1	10.352	27.069	-0.150
700	4.858	34.329	10.4	93.1	11.364	27.166	-0.130
800	4.465	34.380	10.6	93.1	12.294	27.251	-0.133
900	4.172	34.424	13.9	93.2	13.159	27.318	-0.130
1000	3.925	34.463	19.2	93.2	13.969	27.374	-0.126
1013	3.883	34.466	20.5	93.2	14.071	27.381	-0.128

Station: 25 Date: 6/30/2006, 1513 Lat.: 36° 00.50 N Long.: 125° 18.99 W

P(dbar)	T(°C)	S	O <sub>2</sub> (μm/kg)	Xmiss(%)	ΔΦ	σ <sub>θ</sub>	π <sub>θ</sub>
0	16.450	32.887	258.2	91.6	0.078	24.021	0.790
10	16.458	32.889	258.2	91.7	0.388	24.020	0.793
20	15.995	32.873	262.1	90.8	0.773	24.114	0.671
30	15.884	32.894	262.2	91.2	1.150	24.155	0.662
50	13.837	32.843	276.2	90.5	1.890	24.556	0.165
75	10.725	33.308	197.9	92.1	2.631	25.508	-0.075
100	9.711	33.688	146.9	92.7	3.189	25.977	0.050
125	9.415	33.846	123.4	92.7	3.674	26.150	0.126
150	9.126	33.938	113.8	92.7	4.129	26.269	0.151
200	8.528	34.052	95.2	92.9	4.968	26.453	0.146
250	7.684	34.071	87.3	93.0	5.736	26.594	0.034
300	7.170	34.097	67.3	93.1	6.454	26.688	-0.020
400	6.453	34.165	39.1	93.0	7.778	26.839	-0.064
500	5.722	34.215	23.0	93.1	8.979	26.972	-0.118
600	5.141	34.281	13.0	93.2	10.062	27.094	-0.135
700	4.798	34.351	10.2	93.2	11.049	27.190	-0.120
800	4.527	34.400	11.8	93.2	11.962	27.260	-0.111
900	4.192	34.438	15.6	93.2	12.820	27.326	-0.117
1000	3.890	34.462	19.5	93.1	13.626	27.377	-0.130
1013	3.843	34.466	20.4	93.1	13.727	27.385	-0.132

Station: 26 Date: 6/30/2006, 1845 Lat.: 36° 18.70 N Long.: 125° 32.54 W

P(dbar)	T(°C)	S	O <sub>2</sub> (μm/kg)	Xmiss(%)	ΔΦ	σ <sub>θ</sub>	π <sub>θ</sub>
0	16.287	32.887	258.8	91.2	0.077	24.058	0.751
10	16.285	32.888	259.6	91.4	0.385	24.059	0.752
20	16.067	32.897	260.5	91.3	0.768	24.116	0.707
30	15.903	32.882	261.3	91.4	1.146	24.142	0.656
50	13.570	32.937	276.0	89.8	1.876	24.683	0.184
75	10.028	33.542	156.0	92.5	2.524	25.810	-0.011
100	9.333	33.759	134.5	92.8	3.036	26.095	0.044
125	8.850	33.851	142.3	92.8	3.499	26.244	0.039
150	8.658	33.964	122.9	92.9	3.931	26.363	0.098
200	7.835	34.001	122.5	93.0	4.735	26.516	0.001
250	7.441	34.060	87.5	93.0	5.481	26.620	-0.010
300	7.165	34.114	63.3	93.0	6.189	26.702	-0.006
400	6.337	34.166	37.2	93.0	7.498	26.855	-0.078
500	5.617	34.215	21.6	93.1	8.683	26.985	-0.130
600	5.141	34.271	13.7	93.1	9.769	27.087	-0.143
700	4.772	34.350	10.2	93.2	10.761	27.192	-0.123
800	4.503	34.401	11.8	93.1	11.673	27.263	-0.113
900	4.135	34.431	14.8	93.1	12.528	27.326	-0.129
1000	3.888	34.464	19.7	93.1	13.332	27.379	-0.129
1011	3.867	34.465	20.2	93.2	13.418	27.382	-0.130

Station: 27 Date: 6/30/2006, 2153 Lat.: 36° 36.80 N Long.: 125° 46.25 W

P(dbar)	T(°C)	S	O <sub>2</sub> (μm/kg)	Xmiss(%)	ΔΦ	σ <sub>θ</sub>	π <sub>θ</sub>
0	15.952	32.790	261.0	91.7	0.077	24.059	0.596
10	15.947	32.790	260.8	91.7	0.385	24.061	0.595
20	15.916	32.790	261.0	91.7	0.769	24.068	0.587
30	15.513	32.771	264.5	91.2	1.149	24.143	0.478
50	11.925	32.866	267.5	89.5	1.845	24.947	-0.204
75	10.136	33.253	202.4	92.3	2.515	25.567	-0.223
100	9.329	33.688	148.9	92.7	3.052	26.040	-0.013
125	8.886	33.881	141.0	92.8	3.518	26.262	0.068
150	8.539	33.945	129.2	92.8	3.947	26.367	0.064
200	8.074	34.032	99.7	92.8	4.753	26.506	0.062
250	7.561	34.092	75.4	92.8	5.501	26.628	0.032
300	7.124	34.123	59.2	92.9	6.203	26.714	-0.005
400	6.273	34.168	36.5	92.9	7.502	26.865	-0.085
500	5.753	34.209	23.0	93.0	8.693	26.963	-0.119
600	5.242	34.289	12.7	93.0	9.783	27.089	-0.117
700	4.827	34.353	10.2	93.0	10.772	27.189	-0.114
800	4.471	34.401	11.7	93.0	11.687	27.266	-0.117
900	4.076	34.424	14.3	93.1	12.542	27.327	-0.141
1000	3.847	34.453	17.7	93.1	13.347	27.374	-0.142
1100	3.588	34.481	22.8	93.1	14.110	27.423	-0.145
1200	3.355	34.501	27.6	93.1	14.834	27.462	-0.152
1300	3.178	34.520	33.0	93.1	15.525	27.494	-0.154
1400	2.987	34.537	38.2	93.1	16.189	27.526	-0.158
1500	2.818	34.551	43.3	93.1	16.828	27.552	-0.163
1750	2.429	34.582	56.6	93.1	18.320	27.612	-0.172
2000	2.119	34.608	70.4	93.1	19.690	27.659	-0.178
2500	1.796	34.638	90.4	93.1	22.187	27.711	-0.182
3000	1.647	34.660	111.4	93.1	24.543	27.742	-0.178
3500	1.554	34.673	127.0	93.1	26.842	27.763	-0.177
4000	1.507	34.684	142.1	93.1	29.110	27.778	-0.176
4071	1.507	34.684	143.8	93.1	29.433	27.779	-0.176

Station: 28 Date: 7/01/2006, 0314 Lat.: 36° 46.84 N Long.: 125° 24.75 W

P(dbar)	T(°C)	S	O <sub>2</sub> (μm/kg)	Xmiss(%)	ΔΦ	σ <sub>θ</sub>	π <sub>θ</sub>
0	15.898	32.826	262.5	91.4	0.076	24.099	0.612
10	15.898	32.827	262.3	91.5	0.381	24.100	0.612
20	15.900	32.827	262.8	91.5	0.762	24.100	0.612
30	15.677	32.806	262.6	91.5	1.142	24.133	0.544
50	14.374	32.839	263.7	89.8	1.876	24.441	0.277
75	11.220	33.235	205.3	91.9	2.605	25.364	-0.043
100	9.857	33.585	151.2	92.5	3.196	25.873	-0.007
125	9.352	33.781	136.5	92.6	3.699	26.109	0.064
150	8.998	33.880	134.1	92.6	4.162	26.244	0.084
200	8.311	34.007	106.7	92.7	5.013	26.450	0.077
250	7.753	34.049	88.4	92.8	5.789	26.567	0.027
300	7.378	34.095	72.1	92.9	6.522	26.657	0.009
400	6.463	34.153	41.9	92.9	7.863	26.829	-0.072
500	5.800	34.222	22.5	92.9	9.065	26.968	-0.103
600	5.210	34.250	15.4	93.0	10.166	27.062	-0.151
700	4.654	34.300	10.6	93.0	11.176	27.166	-0.175
800	4.426	34.376	10.6	93.0	12.105	27.251	-0.141
900	4.122	34.423	14.0	93.0	12.966	27.321	-0.136
1000	3.833	34.453	17.8	93.1	13.773	27.375	-0.143
1011	3.813	34.456	18.5	93.1	13.859	27.380	-0.142

Station: 29 Date: 7/01/2006, 0637 Lat.: 36° 56.75 N Long.: 125° 03.44 W

P(dbar)	T(°C)	S	O <sub>2</sub> (μm/kg)	Xmiss(%)	ΔΦ	σ <sub>θ</sub>	π <sub>θ</sub>
0	15.670	32.798	263.2	91.4	0.076	24.128	0.537
10	15.671	32.798	262.9	91.3	0.378	24.128	0.537
20	14.858	32.818	269.9	90.9	0.749	24.321	0.368
30	14.605	32.822	272.1	90.2	1.106	24.379	0.316
50	14.310	32.862	264.7	91.2	1.808	24.472	0.282
75	11.512	32.724	267.8	92.4	2.616	24.913	-0.398
100	10.509	32.941	246.6	92.6	3.345	25.260	-0.408
125	9.375	33.464	169.0	92.5	3.943	25.858	-0.184
150	8.938	33.783	138.7	92.5	4.442	26.177	-0.002
200	8.352	33.951	128.0	92.7	5.312	26.401	0.039
250	7.870	34.048	94.5	92.8	6.101	26.549	0.043
300	7.299	34.075	75.7	92.9	6.837	26.653	-0.018
400	5.868	34.047	64.0	93.0	8.185	26.820	-0.231
500	5.480	34.134	34.4	93.0	9.407	26.938	-0.210
600	4.907	34.229	16.1	93.0	10.503	27.080	-0.203
700	4.612	34.287	11.1	93.1	11.508	27.159	-0.190
800	4.327	34.353	9.8	93.1	12.442	27.244	-0.169
900	4.113	34.407	12.5	93.1	13.314	27.310	-0.150
1000	3.818	34.454	18.0	93.0	14.125	27.378	-0.143
1010	3.757	34.457	18.3	93.1	14.203	27.386	-0.147

Station: 30 Date: 7/01/2006, 1011 Lat.: 37° 06.83 N Long.: 124° 41.39 W

P(dbar)	T(°C)	S	O <sub>2</sub> (μm/kg)	Xmiss(%)	ΔΦ	σ <sub>θ</sub>	π <sub>θ</sub>
0	15.396	32.736	263.2	91.5	0.075	24.141	0.425
10	15.397	32.736	263.4	91.7	0.377	24.141	0.425
20	15.336	32.734	263.8	91.7	0.754	24.154	0.409
30	14.944	32.732	266.7	91.3	1.124	24.237	0.319
50	14.864	32.731	265.5	91.3	1.860	24.254	0.300
75	11.428	33.145	220.7	92.5	2.672	25.256	-0.076
100	10.269	33.486	164.3	92.7	3.292	25.727	-0.014
125	9.095	33.649	155.6	92.6	3.811	26.047	-0.082
150	8.610	33.863	130.8	92.6	4.273	26.291	0.010
200	8.013	33.993	101.9	92.7	5.102	26.484	0.021
250	7.571	34.039	86.7	92.8	5.862	26.585	-0.008
300	7.058	34.081	68.2	92.9	6.576	26.691	-0.047
400	6.134	34.121	44.0	92.9	7.893	26.846	-0.139
500	5.355	34.155	28.6	93.0	9.084	26.969	-0.209
600	4.879	34.223	16.4	93.0	10.170	27.079	-0.210
700	4.642	34.313	10.4	93.0	11.166	27.177	-0.166
800	4.377	34.379	10.4	93.0	12.084	27.259	-0.143
900	4.077	34.424	13.6	93.0	12.938	27.327	-0.140
1000	3.791	34.458	18.3	93.0	13.734	27.384	-0.143
1010	3.773	34.460	18.9	93.0	13.811	27.388	-0.143

Station: 31 Date: 7/01/2006, 1350 Lat.: 37° 16.87 N Long.: 124° 19.89 W

P(dbar)	T(°C)	S	O <sub>2</sub> (μm/kg)	Xmiss(%)	ΔΦ	σ <sub>θ</sub>	π <sub>θ</sub>
0	15.007	32.831	271.1	89.9	0.072	24.299	0.413
10	15.005	32.834	271.0	90.0	0.362	24.302	0.414
20	15.003	32.839	271.7	90.0	0.723	24.306	0.417
30	14.853	32.935	282.0	89.8	1.082	24.413	0.460
50	12.803	33.038	265.4	88.4	1.717	24.913	0.106
75	9.912	33.494	206.7	92.2	2.374	25.792	-0.069
100	9.267	33.696	168.5	92.3	2.893	26.056	-0.017
125	8.863	33.839	133.0	92.4	3.357	26.232	0.031
150	8.320	33.907	120.5	92.4	3.790	26.370	-0.000
200	7.928	34.042	83.8	92.5	4.584	26.535	0.048
250	7.314	34.067	74.6	92.8	5.323	26.643	-0.022
300	6.791	34.074	66.1	92.9	6.018	26.721	-0.089
400	5.844	34.115	40.1	93.0	7.300	26.877	-0.180
500	5.305	34.155	27.7	93.0	8.471	26.975	-0.215
600	4.782	34.220	15.8	93.0	9.552	27.087	-0.223
700	4.418	34.280	10.4	93.0	10.546	27.175	-0.217
800	4.231	34.352	9.1	93.0	11.463	27.253	-0.180
900	3.971	34.416	12.1	93.0	12.317	27.331	-0.157
1000	3.779	34.456	17.8	93.0	13.113	27.383	-0.146
1012	3.750	34.458	18.1	93.0	13.206	27.388	-0.147

Station: 32 Date: 7/01/2006, 1738 Lat.: 37° 26.88 N Long.: 123° 58.20 W

P(dbar)	T(°C)	S	O <sub>2</sub> (μm/kg)	Xmiss(%)	ΔΦ	σ <sub>θ</sub>	π <sub>θ</sub>
0	14.967	32.821	269.5	90.3	0.072	24.300	0.396
10	14.963	32.822	270.0	90.4	0.362	24.302	0.395
20	14.958	32.822	270.0	90.4	0.723	24.303	0.394
30	14.129	32.868	268.5	89.0	1.077	24.514	0.248
50	10.944	33.063	243.9	91.7	1.691	25.278	-0.231
75	9.548	33.470	168.8	92.5	2.289	25.834	-0.149
100	9.134	33.705	144.1	92.5	2.799	26.085	-0.031
125	8.931	33.851	126.8	92.4	3.261	26.232	0.052
150	8.514	33.929	112.0	92.5	3.696	26.358	0.047
200	7.944	34.002	99.6	92.7	4.506	26.502	0.019
250	7.595	34.083	74.1	92.8	5.257	26.616	0.030
300	7.125	34.111	59.0	92.9	5.964	26.705	-0.014
400	6.230	34.176	35.3	92.8	7.263	26.877	-0.084
500	5.556	34.211	21.4	92.9	8.431	26.989	-0.141
600	5.069	34.276	12.6	93.0	9.501	27.099	-0.147
700	4.707	34.339	9.6	93.0	10.484	27.191	-0.139
800	4.456	34.387	10.7	92.9	11.396	27.257	-0.129
900	4.093	34.429	14.0	92.9	12.252	27.330	-0.134
1000	3.810	34.457	17.6	93.0	13.054	27.381	-0.142
1012	3.787	34.460	18.3	93.0	13.147	27.386	-0.141

Station: 33 Date: 7/01/2006, 2012 Lat.: 37° 31.89 N Long.: 123° 47.37 W

P(dbar)	T(°C)	S	O <sub>2</sub> (μm/kg)	Xmiss(%)	ΔΦ	σ <sub>θ</sub>	π <sub>θ</sub>
0	15.014	32.824	270.8	89.5	0.072	24.292	0.409
10	15.015	32.824	270.6	89.9	0.362	24.292	0.409
20	14.833	32.833	271.6	89.5	0.723	24.338	0.375
30	14.173	32.812	269.5	90.0	1.077	24.462	0.213
50	10.510	33.053	231.9	92.0	1.677	25.346	-0.317
75	9.837	33.454	195.3	92.3	2.280	25.773	-0.114
100	8.997	33.702	138.5	92.5	2.792	26.104	-0.055
125	8.880	33.903	123.3	92.4	3.249	26.280	0.085
150	8.560	34.005	100.5	92.5	3.673	26.410	0.115
200	8.108	34.072	81.7	92.5	4.463	26.532	0.098
250	7.583	34.093	71.0	92.7	5.205	26.625	0.036
300	6.954	34.096	62.3	92.9	5.908	26.717	-0.050
400	6.246	34.155	37.6	92.9	7.205	26.858	-0.098
500	5.649	34.231	20.2	92.9	8.384	26.994	-0.113
600	5.225	34.305	12.7	92.8	9.453	27.104	-0.107
700	4.826	34.361	10.8	92.8	10.436	27.194	-0.109
800	4.518	34.399	11.7	92.8	11.352	27.260	-0.113
900	4.011	34.442	15.7	93.0	12.195	27.348	-0.133
1000	3.800	34.463	19.1	92.9	12.983	27.387	-0.138
1012	3.785	34.465	19.6	92.9	13.075	27.390	-0.138

Station: 34 Date: 7/01/2006, 2206 Lat.: 37° 36.84 N Long.: 123° 36.49 W

P(dbar)	T(°C)	S	O <sub>2</sub> (μm/kg)	Xmiss(%)	ΔΦ	σ <sub>θ</sub>	π <sub>θ</sub>
0	14.902	32.899	272.6	87.0	0.071	24.374	0.443
10	14.925	32.905	272.8	87.0	0.355	24.374	0.453
20	14.786	32.884	272.4	87.4	0.709	24.388	0.405
30	13.649	32.884	264.6	88.9	1.057	24.625	0.159
50	10.361	33.114	220.2	91.8	1.624	25.419	-0.294
75	9.680	33.506	167.1	92.3	2.212	25.840	-0.099
100	9.385	33.731	130.7	92.3	2.719	26.065	0.030
125	9.055	33.908	106.5	92.2	3.183	26.256	0.116
150	8.787	33.997	90.4	92.3	3.614	26.369	0.144
200	8.199	34.075	77.8	92.4	4.419	26.521	0.114
250	7.558	34.062	79.1	92.7	5.167	26.605	0.008
300	7.235	34.116	62.6	92.8	5.881	26.694	0.005
400	6.349	34.141	41.8	92.8	7.203	26.834	-0.096
500	5.738	34.220	21.8	92.8	8.402	26.974	-0.111
600	5.122	34.278	12.7	93.0	9.483	27.095	-0.139
700	4.830	34.349	10.8	92.7	10.471	27.185	-0.117
800	4.532	34.397	11.6	92.8	11.388	27.256	-0.113
900	4.274	34.426	14.3	92.7	12.259	27.309	-0.118
1000	4.030	34.449	17.3	92.6	13.085	27.353	-0.126
1014	3.962	34.453	17.8	92.9	13.198	27.363	-0.130

Station: 35 Date: 7/02/2006, 0037 Lat.: 37° 41.85 N Long.: 123° 25.59 W

P(dbar)	T(°C)	S	O <sub>2</sub> (μm/kg)	Xmiss(%)	ΔΦ	σ <sub>θ</sub>	π <sub>θ</sub>
0	15.047	33.051	283.3	85.4	0.069	24.460	0.596
10	14.971	33.056	282.6	85.2	0.346	24.480	0.583
20	12.081	33.333	296.9	78.9	0.640	25.280	0.200
30	10.828	33.392	254.6	85.4	0.892	25.554	0.011
50	10.220	33.560	184.6	91.4	1.352	25.791	0.037
75	9.864	33.684	136.6	92.0	1.884	25.948	0.073
100	9.325	33.819	118.4	92.1	2.377	26.143	0.090
125	9.108	33.919	98.9	92.1	2.832	26.256	0.134
150	8.866	33.962	96.1	92.2	3.269	26.329	0.128
200	8.309	34.041	90.0	92.4	4.092	26.478	0.104
250	7.863	34.110	70.6	92.7	4.851	26.599	0.091
300	7.342	34.133	57.6	92.8	5.568	26.693	0.034
400	6.247	34.141	41.0	92.8	6.887	26.847	-0.109
500	5.547	34.187	25.0	92.9	8.086	26.971	-0.161
600	5.221	34.301	12.8	92.7	9.169	27.101	-0.110
700	4.891	34.346	10.6	92.8	10.158	27.176	-0.113
800	4.639	34.382	11.0	92.8	11.098	27.233	-0.113
900	4.401	34.409	12.4	92.8	11.991	27.281	-0.118
1000	4.186	34.438	15.6	92.7	12.844	27.328	-0.119
1011	4.143	34.439	15.8	92.6	12.936	27.333	-0.122



Station: 36 Date: 7/02/2006, 0334 Lat.: 37° 46.68 N Long.: 123° 14.94 W

P(dbar)	T(°C)	S	O <sub>2</sub> (µm/kg)	Xmiss(%)	ΔΦ	σ <sub>θ</sub>	π <sub>θ</sub>
0	12.980	33.173	284.3	83.8	0.059	24.982	0.251
10	12.991	33.171	284.8	83.8	0.297	24.978	0.251
20	12.281	33.261	272.5	87.7	0.587	25.186	0.181
30	11.189	33.381	218.0	90.6	0.849	25.482	0.068
50	10.604	33.560	177.7	91.9	1.327	25.725	0.104
75	9.842	33.763	122.5	92.0	1.855	26.014	0.132
100	9.415	33.930	143.1	91.0	2.327	26.216	0.193
125	9.081	33.986	101.8	90.4	2.768	26.313	0.182
134	9.035	33.992	93.1	90.7	2.922	26.325	0.179

Station: 37 Date: 7/02/2006, 0547 Lat.: 37° 52.07 N Long.: 123° 03.88 W

P(dbar)	T(°C)	S	O <sub>2</sub> (µm/kg)	Xmiss(%)	ΔΦ	σ <sub>θ</sub>	π <sub>θ</sub>
0	12.225	33.593	302.3	82.7	0.050	25.453	0.434
10	12.222	33.592	302.9	82.8	0.252	25.454	0.432
20	10.424	33.568	225.0	87.6	0.486	25.762	0.079
30	10.049	33.641	175.8	91.3	0.705	25.883	0.072
50	9.557	33.749	139.4	92.0	1.109	26.050	0.074
75	9.248	33.904	103.4	86.1	1.576	26.222	0.145
85	9.170	33.936	92.1	80.9	1.754	26.260	0.158

Station: 38 Date: 7/02/2006, 0726 Lat.: 37° 56.82 N Long.: 122° 52.94 W

P(dbar)	T(°C)	S	O <sub>2</sub> (µm/kg)	Xmiss(%)	ΔΦ	σ <sub>θ</sub>	π <sub>θ</sub>
0	12.190	33.174	291.6	74.7	0.056	25.136	0.095
10	10.485	33.708	250.9	84.9	0.263	25.860	0.202
20	9.511	33.770	137.8	91.7	0.464	26.073	0.083
30	9.441	33.889	152.7	91.5	0.652	26.177	0.166
40	9.246	33.942	132.7	89.5	0.831	26.251	0.176

**Table 3:** *Results of nutrient and primary productivity analyses of water samples collected at each hydrographic station during the PaCOOS cruise of June/July 2006. Stations are in chronological (and numerical) order. The time listed (<Mon. dd, yyyy hh:mm>) for each station is the beginning of the CTD cast. 12 Niskin bottles were tripped at each station, although some bottles sampled duplicate pressures. Except where primary productivity analyses were not performed (see Introduction), the data for each station are separated into two sections ("Physical and Chemical" and "Biological").*

The physical oceanographic properties listed in the first seven columns of the "Physical and Chemical" section of each station's data are the uncorrected values measured by the CTD at the times each Niskin bottle was tripped. Because they are uncorrected, these values may differ slightly from those listed in Table 2. The last four columns of this section give the nitrate (NO<sub>3</sub>), nitrite (NO<sub>2</sub>), phosphate (PO<sub>4</sub>), and dissolved silicate (SiO<sub>4</sub>) concentrations.

The "Biological" section of each station's data gives the results of the primary productivity analyses. As stated above, primary productivity sampling was not undertaken at every hydrographic station.

Date	Jun 28, 2006 13:10	Cruise:	S306	Latitude:	36.797	Year:	2006
Project:	CALCOFI	Station:	C1	Longitude:	-121.847	Work week:	26
Platform:	MCARTHUR II	Cast:	1	Secchi Depth:	---	Day of Year:	179

\* Note: Latitude and Longitude are reported in decimal degrees. '---' signifies no data.

#### Physical and Chemical

DEP (m)	PRESS (db)	BTL #	TEMP (°C)	SAL (psu)	SIGMA T	TRANSMISS (%)	NO3 (μM)	NO2 (μM)	PO4 (μM)	SIO4 (μM)
0	1.1	12	12.270	33.787	25.596	78	9.637	0.189	1.065	12.938
5	4.6	11	11.713	33.792	25.705	81	11.765	0.218	1.418	13.995
10	10.2	10	11.191	33.796	25.804	81	15.252	0.224	1.313	16.368
20	20.7	9	10.772	33.811	25.891	84	17.733	0.237	1.601	19.373
30	30.6	8	10.393	33.841	25.980	87	17.778	0.282	1.948	19.495
40	40.9	7	9.708	33.930	26.166	90	24.880	0.254	1.924	29.974
60	60.7	6	9.409	33.952	26.233	89	26.969	0.260	1.972	33.037
80	80.6	5	9.284	33.965	26.264	89	27.397	0.301	2.156	34.772
100	100.5	4	9.230	33.963	26.271	87	27.649	0.334	2.133	36.127
150	150.4	3	8.278	34.090	26.520	82	22.990	0.250	1.741	26.777
200	201.5	2	7.985	34.124	26.591	82	32.284	0.227	2.599	50.523
220	221.8	1	7.891	34.135	26.614	83	32.942	0.200	2.488	50.231

#### Biological

DEP (m)	BTL #	CHL (mg m-3 d-1)	PHAEO (mg m-3 d-1)	DEP (m)	% S. I.	CARBON (mg m-3 d-1)	PROD INDEX carbon/chl (mg m-3 d-1)	LIGHT DEPTH (m)
0	12	6.063	2.596	0	100	197.618	32.594	0
5	11	6.392	4.138	0	50	166.771	27.506	2
10	10	7.144	4.256	5	30	193.370	30.252	4
20	9	5.687	2.450	5	15	138.481	21.665	6
40	7	1.363	1.822	10	5	95.376	13.351	9
60	6	0.442	0.933	10	1	16.533	2.314	14
80	5	0.470	0.766	20	0.1	1.066	0.188	22
100	4	0.489	0.799					
150	3	0.133	0.312					
200	2	0.174	0.474					

#### Integrated Value

Integrated values are 1.0% of Surface Intensity (S.I.)

Chlorophyll <i>a</i> :	94.33	mg m-2 day -1	Carbon Fixation:	1696.7	mg m-2 day-1
Phaeophytin:	54.67	mg m-2 day -1	Productivity Index:	17.99	mg C mg Chl day-1
Mixed Layer	3	meters	PBOpt:	32.59	mg C mg Chl day-1

Date	Jun 28, 2006 15:22	Cruise:	S306	Latitude:	36.735	Year:	2006
Project:	CALCOFI	Station:	H3	Longitude:	-122.019	Work week:	26
Platform:	MCARTHUR II	Cast:	2	Secchi Depth:	---	Day of Year:	179

\* Note: Latitude and Longitude are reported in decimal degrees. '---' signifies no data.

### Physical and Chemical

DEP (m)	PRESS (db)	BTL #	TEMP (°C)	SAL (psu)	SIGMA T	TRANSMISS (%)	NO3 (μM)	NO2 (μM)	PO4 (μM)	SIO4 (μM)
0	1.0	12	13.855	33.512	25.067	72	2.757	0.137	0.195	3.025
5	4.8	11	12.848	33.561	25.308	75	6.908	0.208	0.670	5.681
10	9.9	10	12.213	33.623	25.480	78	12.622	0.244	1.139	10.504
20	20.3	9	11.071	33.714	25.762	88	18.278	0.236	1.366	17.609
30	30.0	8	9.996	33.752	25.979	92	23.346	0.277	1.550	24.311
40	40.5	7	9.877	33.837	26.065	91	24.426	0.366	1.817	25.953
60	60.7	6	9.612	33.930	26.182	91	25.706	0.270	1.960	29.252
80	80.2	5	9.494	33.961	26.226	91	26.458	0.252	2.007	30.817
100	100.8	4	9.373	33.961	26.247	91	27.143	0.249	1.954	32.048
150	151.4	3	8.896	34.055	26.397	90	29.537	0.136	2.112	38.391
200	201.8	2	8.536	34.145	26.525	92	31.115	0.070	2.353	42.824
1000	1009.9	1	4.147	34.435	27.329	88	42.097	0.043	3.160	119.43

### Biological

DEP (m)	BTL #	CHL (mg m-3 d-1)	PHAEO (mg m-3 d-1)	DEP (m)	% S. I.	CARBON (mg m-3 d-1)	PROD INDEX carbon/chl (mg m-3 d-1)	LIGHT DEPTH (m)
0	12	7.708	2.909	0	100	334.741	43.428	0
5	11	7.896	3.852	0	50	336.345	43.636	2
10	10	6.195	2.169	5	30	340.761	43.156	4
20	9	2.641	1.771	5	15	243.754	30.871	6
30	8	0.846	1.164	10	5	103.378	16.688	9
40	7	0.714	1.331	10	1	18.675	3.015	15
60	6	0.686	1.516	20	0.1	0.573	0.217	25
80	5	0.423	1.013					
100	4	0.385	0.894					
150	3	0.116	0.474					
200	2	0.043	0.239					
1000	1	0.030	0.179					

### Integrated Value

Integrated values are 1.0% of Surface Intensity (S.I.)

Chlorophyll <i>a</i> :	103.47	mg m-2 day -1	Carbon Fixation:	2736.6	mg m-2 day-1
Phaeophytin:	41.71	mg m-2 day -1	Productivity Index:	26.45	mg C mg Chl day-1
Mixed Layer	3	meters	PBOpt:	43.64	mg C mg Chl day-1

Date	Jun 28, 2006 17:54	Cruise:	S306	Latitude:	36.708	Year:	2006
Project:	CALCOFI	Station:	NPS1	Longitude:	-122.239	Work week:	26
Platform:	MCARTHUR II	Cast:	3	Secchi Depth:	---	Day of Year:	179

\* Note: Latitude and Longitude are reported in decimal degrees. '---' signifies no data.

# Physical and Chemical

DEP (m)	PRESS (db)	BTL #	TEMP (°C)	SAL (psu)	SIGMA T	TRANSMISS (%)	NO3 (µM)	NO2 (µM)	PO4 (µM)	SIO4 (µM)
0	1.0	12	13.651	33.608	25.183	72	7.536	0.148	0.685	8.033
50	50.3	11	9.212	33.902	26.226	92	28.247	0.179	2.009	32.705
100	100.1	10	8.952	34.042	26.377	92	29.189	0.047	2.014	36.114
200	202.1	9	8.355	34.145	26.552	93	31.036	0.027	2.255	43.000
300	302.6	8	7.599	34.193	26.703	93	33.667	0.033	2.311	53.748
400	403.7	7	6.948	34.223	26.819	93	35.690	0.018	2.358	62.989
500	504.6	6	6.321	34.254	26.928	93	37.410	0.040	2.694	73.444
600	604.8	5	5.740	34.294	27.034	93	39.081	0.020	2.746	84.451
700	705.8	4	5.090	34.346	27.153	93	40.478	0.019	2.881	96.927
800	807.4	3	4.683	34.387	27.232	92	41.279	0.020	3.012	107.14
900	908.6	2	4.256	34.434	27.316	93	42.053	0.031	3.027	112.64
1000	1009.5	1	3.894	34.467	27.380	92	42.007	0.033	3.023	121.85

Date: Jun 28, 2006 19:53      Cruise: S306      Latitude: 36.627      Year: 2006  
 Project: CALCOFI      Station: 67-55      Longitude: -122.419      Work week: 26  
 Platform: MCARTHUR II      Cast: 4      Secchi Depth: ---      Day of Year: 179

\* Note: Latitude and Longitude are reported in decimal degrees. '---' signifies no data.

### Physical and Chemical

DEP (m)	PRESS (db)	BTL #	TEMP (°C)	SAL (psu)	SIGMA T	TRANSMISS (%)	NO3 (μM)	NO2 (μM)	PO4 (μM)	SIO4 (μM)
0	1.2	12	14.900	33.265	24.656	87	2.892	0.157	0.300	2.166
5	4.8	11	13.857	33.262	24.874	85	5.623	0.157	0.679	3.607
10	10.4	10	12.163	33.442	25.348	88	9.707	0.185	1.058	6.763
20	20.5	9	11.592	33.530	25.524	89	13.119	0.213	1.172	11.331
30	30.2	8	10.696	33.575	25.720	91	17.802	0.224	1.409	17.926
40	41.4	7	9.997	33.762	25.987	92	22.324	0.236	1.669	24.291
60	60.3	6	9.409	33.914	26.203	92	26.318	0.040	2.037	30.617
80	80.1	5	9.311	33.971	26.264	92	27.250	0.051	1.974	32.367
100	100.7	4	9.218	33.985	26.290	92	27.797	0.038	1.946	33.344
150	151.7	3	8.916	34.087	26.419	92	29.464	0.057	2.219	37.500
200	202.0	2	8.664	34.151	26.509	92	30.456	0.027	2.327	41.336
1000	1011.4	1	4.047	34.455	27.356	93	42.668	0.013	3.104	117.73

### Biological

DEP (m)	BTL #	CHL (mg m-3 d-1)	PHAEO (mg m-3 d-1)	DEP (m)	% S. I.	CARBON (mg m-3 d-1)	PROD INDEX carbon/chl (mg m-3 d-1)	LIGHT DEPTH (m)
0	12	2.284	0.640	0	100	203.716	89.185	0
5	11	2.406	1.710	5	50	165.009	68.571	3
10	10	2.087	1.594	5	30	136.736	56.822	6
20	9	1.542	1.574	10	15	51.777	24.812	9
30	8	0.884	1.135	20	5	22.288	14.458	14
40	7	0.273	0.754	30	1	2.265	2.563	22
60	6	0.155	0.580	40	0.1	0.264	0.970	36
80	5	0.149	0.610					
100	4	0.132	0.608					
150	3	0.085	0.407					
200	2	0.053	0.200					
1000	1	0.038	0.005					

### Integrated Value

Integrated values are 1.0% of Surface Intensity (S.I.)

Chlorophyll <i>a</i> :	40.41	mg m-2 day -1	Carbon Fixation:	1581.3	mg m-2 day-1
Phaeophytin:	32.84	mg m-2 day -1	Productivity Index:	39.13	mg C mg Chl day-1
Mixed Layer	3	meters	PBOpt:	89.18	mg C mg Chl day-1

Date	Jun 28, 2006 22:36	Cruise:	S306	Latitude:	36.545	Year:	2006
Project:	CALCOFI	Station:	NPS2	Longitude:	-122.597	Work week:	26
Platform:	MCARTHUR II	Cast:	5	Secchi Depth:	---	Day of Year:	179

\* Note: Latitude and Longitude are reported in decimal degrees. '---' signifies no data.

# Physical and Chemical

DEP (m)	PRESS (db)	BTL #	TEMP (°C)	SAL (psu)	SIGMA T	TRANSMISS (%)	NO3 (μM)	NO2 (μM)	PO4 (μM)	SIO4 (μM)
0	0.8	12	14.765	33.292	24.706	90	4.232	0.168	0.374	1.781
50	50.0	11	9.625	33.814	26.089	92	25.511	0.210	1.794	27.100
100	100.4	10	9.030	34.054	26.375	92	28.816	0.029	2.173	36.563
200	201.4	9	8.537	34.153	26.531	92	30.670	0.010	2.230	43.052
300	302.8	8	7.824	34.222	26.693	93	33.264	0.029	2.576	51.729
400	403.4	7	6.977	34.228	26.819	93	35.854	0.012	2.745	63.362
500	504.7	6	6.275	34.258	26.937	93	37.644	0.009	2.835	74.694
600	604.7	5	5.676	34.299	27.045	93	39.844	0.009	2.871	86.791
700	706.6	4	5.151	34.350	27.149	93	41.134	0.026	3.219	96.015
800	808.1	3	4.690	34.395	27.238	93	41.752	0.019	3.280	106.15
900	908.0	2	4.430	34.420	27.287	92	---	---	---	---
1000	1010.1	1	4.154	34.448	27.339	93	---	---	---	---

Date: Jun 29, 2006 0:42      Cruise: S306      Latitude: 36.46      Year: 2006  
 Project: CALCOFI      Station: 67-60      Longitude: -122.776      Work week: 26  
 Platform: MCARTHUR II      Cast: 6      Secchi Depth: ---      Day of Year: 180

\* Note: Latitude and Longitude are reported in decimal degrees. '---' signifies no data.

### Physical and Chemical

DEP (m)	PRESS (db)	BTL #	TEMP (°C)	SAL (psu)	SIGMA T	TRANSMISS (%)	NO3 (μM)	NO2 (μM)	PO4 (μM)	SIO4 (μM)
0	1.2	12	15.084	33.174	24.546	91	1.059	0.103	0.280	0.889
5	5.4	11	14.880	33.174	24.590	91	1.374	0.106	0.281	0.932
10	9.4	10	14.002	33.203	24.799	91	3.506	0.203	0.409	2.064
20	20.2	9	11.688	33.295	25.324	91	10.816	0.171	0.844	8.269
30	29.9	8	10.771	33.231	25.439	92	14.530	0.113	1.087	12.355
40	40.6	7	10.766	33.487	25.639	92	17.315	0.130	1.302	15.595
60	60.4	6	10.069	33.709	25.933	92	21.321	0.172	1.589	21.515
80	81.0	5	9.942	33.875	26.085	92	23.820	0.295	1.812	25.902
100	100.4	4	9.498	33.924	26.197	92	21.640	0.193	1.726	25.063
150	150.1	3	8.764	34.052	26.416	92	29.438	0.064	2.154	36.343
200	200.8	2	8.327	34.115	26.533	93	29.860	0.032	2.175	40.456
1000	1007.4	1	4.055	34.456	27.356	93	42.747	0.005	3.069	117.18

### Biological

DEP (m)	BTL #	CHL (mg m-3 d-1)	PHAEO (mg m-3 d-1)	DEP (m)	% S. I.	CARBON (mg m-3 d-1)	PROD INDEX carbon/chl (mg m-3 d-1)	LIGHT DEPTH (m)
0	12	0.232	0.032	0	100	20.861	89.847	0
5	11	0.268	0.034	10	50	19.389	66.111	9
10	10	0.293	0.151	10	30	21.275	72.541	14
20	9	0.526	0.570	20	15	20.781	39.478	21
30	8	0.348	0.383	40	5	7.606	20.432	30
40	7	0.372	0.336	60	1	1.340	3.314	45
60	6	0.404	0.814	80	0.1	0.053	0.176	64
80	5	0.301	0.770					
100	4	0.254	0.738					
150	3	0.048	0.354					
200	2	0.027	0.194					
1000	1	0.013	0.025					

### Integrated Value

Integrated values are 1.0% of Surface Intensity (S.I.)

Chlorophyll <i>a</i> :	16.43	mg m-2 day -1	Carbon Fixation:	620.28	mg m-2 day-1
Phaeophytin:	16.61	mg m-2 day -1	Productivity Index:	37.75	mg C mg Chl day-1
Mixed Layer	4	meters	PBOpt:	89.85	mg C mg Chl day-1

Date	Jun 29, 2006 3:26	Cruise:	S306	Latitude:	36.376	Year:	2006
Project:	CALCOFI	Station:	NPS3	Longitude:	-122.954	Work week:	26
Platform:	MCARTHUR II	Cast:	7	Secchi Depth:	---	Day of Year:	180

\* Note: Latitude and Longitude are reported in decimal degrees. '---' signifies no data.

### Physical and Chemical

DEP (m)	PRESS (db)	BTL #	TEMP (°C)	SAL (psu)	SIGMA T	TRANSMISS (%)	NO3 (μM)	NO2 (μM)	PO4 (μM)	SIO4 (μM)
0	0.7	12	14.136	33.374	24.902	91	4.457	0.185	0.395	2.081
50	51.1	11	9.780	33.831	26.077	92	24.792	0.289	1.599	28.789
100	101.5	10	9.186	33.975	26.287	92	27.735	0.039	1.930	33.279
200	201.8	9	8.179	34.130	26.567	93	31.266	0.042	2.265	43.481
300	302.0	8	7.212	34.189	26.755	93	34.594	0.030	2.369	56.959
400	403.5	7	6.328	34.202	26.884	93	37.712	0.021	2.396	70.279
500	505.3	6	5.925	34.270	26.991	93	39.176	0.013	2.877	77.797
600	605.2	5	5.410	34.312	27.087	93	40.375	0.017	3.088	87.694
700	706.3	4	4.969	34.361	27.179	93	41.363	0.020	3.069	97.451
800	807.3	3	4.621	34.400	27.249	93	42.406	0.049	3.122	104.72
900	908.1	2	4.213	34.440	27.325	93	---	---	---	---
1000	1008.0	1	3.984	34.463	27.369	93	42.565	0.017	3.049	120.73



Date: Jun 29, 2006 5:33      Cruise: S306      Latitude: 36.293      Year: 2006  
 Project: CALCOFI      Station: 67-65      Longitude: -123.131      Work week: 26  
 Platform: MCARTHUR II      Cast: 8      Secchi Depth: ---      Day of Year: 180

\* Note: Latitude and Longitude are reported in decimal degrees. '---' signifies no data.

### Physical and Chemical

DEP (m)	PRESS (db)	BTL #	TEMP (°C)	SAL (psu)	SIGMA T	TRANSMISS (%)	NO3 (μM)	NO2 (μM)	PO4 (μM)	SIO4 (μM)
0	1.0	12	14.217	33.130	24.698	90	3.027	0.172	0.338	0.457
5	5.1	11	14.357	33.112	24.654	90	6.369	0.241	0.563	2.336
10	9.6	10	11.767	33.126	25.178	87	10.474	0.283	0.661	6.767
20	19.8	9	11.533	33.366	25.407	91	14.395	0.178	0.913	12.308
30	30.4	8	10.649	33.476	25.651	92	20.206	0.161	1.466	18.524
40	38.9	7	10.167	33.609	25.838	92	21.880	0.110	1.556	20.972
60	60.1	6	10.003	33.736	25.966	92	23.326	0.268	1.650	23.978
80	80.5	5	9.807	33.870	26.103	92	24.616	0.294	1.839	26.901
100	100.6	4	9.299	33.913	26.221	92	26.954	0.093	1.930	30.851
150	150.9	3	8.827	34.045	26.400	92	29.463	0.056	2.141	37.426
200	200.8	2	8.386	34.131	26.536	93	30.960	0.027	2.097	42.271
1000	1009.6	1	3.886	34.473	27.386	93	42.922	0.006	3.029	120.90

### Biological

DEP (m)	BTL #	CHL (mg m-3 d-1)	PHAEO (mg m-3 d-1)	DEP (m)	% S. I.	CARBON (mg m-3 d-1)	PROD INDEX carbon/chl (mg m-3 d-1)	LIGHT DEPTH (m)
0	12	0.827	0.252	0	100	83.549	101.002	0
5	11	2.087	0.594	10	50	148.114	65.928	4
10	10	2.247	0.530	10	30	125.526	55.874	7
20	9	1.053	0.540	20	15	50.825	48.277	11
30	8	0.338	0.532	40	5	3.041	16.588	18
40	7	0.183	0.463	60	1	0.599	3.050	29
60	6	0.196	0.614	80	0.1	0.256	1.801	50
80	5	0.142	0.516					
100	4	0.152	0.573					
150	3	0.077	0.446					
200	2	0.026	0.222					
1000	1	0.003	0.025					

### Integrated Value

Integrated values are 1.0% of Surface Intensity (S.I.)

Chlorophyll <i>a</i> :	25.60	mg m-2 day -1	Carbon Fixation:	1427.9	mg m-2 day-1
Phaeophytin:	14.70	mg m-2 day -1	Productivity Index:	55.78	mg C mg Chl day-1
Mixed Layer	7	meters	PBOpt:	101.	mg C mg Chl day-1

Date	Jun 29, 2006 8:03	Cruise:	S306	Latitude:	36.209	Year:	2006
Project:	CALCOFI	Station:	NPS4	Longitude:	-123.31	Work week:	26
Platform:	MCARTHUR II	Cast:	9	Secchi Depth:	---	Day of Year:	180

\* Note: Latitude and Longitude are reported in decimal degrees. '---' signifies no data.

### Physical and Chemical

DEP (m)	PRESS (db)	BTL #	TEMP (°C)	SAL (psu)	SIGMA T	TRANSMISS (%)	NO3 (μM)	NO2 (μM)	PO4 (μM)	SIO4 (μM)
0	0.4	12	15.546	32.819	24.172	91	0.043	0.001	0.103	2.366
50	50.2	11	10.702	33.053	25.313	92	14.900	0.137	1.024	13.921
100	100.5	10	9.267	33.807	26.143	92	24.425	0.028	1.613	25.992
200	202.0	9	8.267	34.097	26.528	93	31.450	0.042	2.191	40.643
300	302.4	8	6.770	34.065	26.717	93	34.419	0.021	2.391	55.422
400	402.7	7	6.079	34.152	26.877	93	38.249	0.065	2.879	69.962
500	504.9	6	5.602	34.231	27.000	93	39.955	0.007	2.856	81.050
600	605.3	5	5.129	34.299	27.110	93	41.360	0.000	2.964	90.852
700	706.1	4	4.787	34.357	27.196	93	42.152	0.003	2.980	99.601
800	807.0	3	4.531	34.405	27.263	93	42.315	0.018	3.011	107.08
900	908.9	2	4.217	34.436	27.322	93	42.492	0.011	3.133	101.57
1000	1011.1	1	3.927	34.463	27.374	93	42.977	0.008	3.231	116.65

Date: Jun 29, 2006 9:58      Cruise: S306      Latitude: 36.126      Year: 2006  
 Project: CALCOFI      Station: 67-70      Longitude: -123.491      Work week: 26  
 Platform: MCARTHUR II      Cast: 10      Secchi Depth: ---      Day of Year: 180

\* Note: Latitude and Longitude are reported in decimal degrees. '---' signifies no data.

### Physical and Chemical

DEP (m)	PRESS (db)	BTL #	TEMP (°C)	SAL (psu)	SIGMA T	TRANSMISS (%)	NO3 (μM)	NO2 (μM)	PO4 (μM)	SIO4 (μM)
0	1.1	12	15.583	32.832	24.174	91	0.108	0.022	0.306	1.674
5	5.1	11	15.567	32.830	24.176	91	0.034	0.021	0.325	1.344
10	10.2	10	15.284	32.813	24.225	91	0.000	0.006	0.230	1.453
20	19.5	9	14.602	32.834	24.388	91	0.203	0.037	0.277	1.926
30	29.8	8	14.320	32.816	24.434	91	0.327	0.038	0.178	1.935
40	39.7	7	14.309	32.829	24.447	91	1.516	0.214	0.331	2.388
60	59.5	6	11.106	32.822	25.062	92	8.458	0.045	0.665	7.487
80	79.3	5	10.150	33.399	25.678	92	19.377	0.014	1.190	18.915
100	100.8	4	10.036	33.657	25.899	92	24.800	0.020	1.674	27.344
150	151.0	3	8.946	33.851	26.230	93	22.658	0.048	1.604	22.424
200	202.1	2	8.372	34.004	26.439	93	28.140	0.019	1.985	35.039
1000	1010.8	1	3.937	34.458	27.369	93	42.719	0.001	3.082	117.51

### Biological

DEP (m)	BTL #	CHL (mg m-3 d-1)	PHAEO (mg m-3 d-1)	DEP (m)	% S. I.	CARBON (mg m-3 d-1)	PROD INDEX carbon/chl (mg m-3 d-1)	LIGHT DEPTH (m)
0	12	0.183	0.046	0	100	14.621	79.766	0
5	11	0.196	0.079	10	50	13.343	58.900	10
10	10	0.227	0.067	10	30	15.908	70.221	14
20	9	0.357	1.392	20	15	17.979	50.333	20
30	8	0.562	0.197	40	5	15.573	24.363	28
40	7	0.639	0.275	60	1	1.578	7.203	42
60	6	0.219	0.132	80	0.1	0.035	0.446	68
80	5	0.079	0.174					
100	4	0.055	0.173					
150	3	0.014	0.118					
200	2	0.008	0.054					
1000	1	0.001	0.013					

### Integrated Value

Integrated values are 1.0% of Surface Intensity (S.I.)

Chlorophyll <i>a</i> :	14.90	mg m-2 day -1	Carbon Fixation:	558.58	mg m-2 day-1
Phaeophytin:	14.76	mg m-2 day -1	Productivity Index:	37.49	mg C mg Chl day-1
Mixed Layer	10	meters	PBOpt:	79.77	mg C mg Chl day-1

Date	Jun 29, 2006 11:47	Cruise:	S306	Latitude:	36.126	Year:	2006
Project:	CALCOFI	Station:	67-70	Longitude:	-123.492	Work week:	26
Platform:	MCARTHUR II	Cast:	11	Secchi Depth:	---	Day of Year:	180

\* Note: Latitude and Longitude are reported in decimal degrees. '---' signifies no data.

### Physical and Chemical

DEP (m)	PRESS (db)	BTL #	TEMP (°C)	SAL (psu)	SIGMA T	TRANSMISS (%)	NO3 (μM)	NO2 (μM)	PO4 (μM)	SIO4 (μM)
5	4.9	12	15.762	32.850	24.148	91	---	---	---	---
5	5.2	11	15.769	32.850	24.146	91	---	---	---	---
5	4.7	10	15.768	32.850	24.146	91	---	---	---	---
5	5.4	9	15.771	32.850	24.145	91	---	---	---	---
5	4.9	8	15.771	32.849	24.145	91	---	---	---	---
5	4.9	7	15.769	32.848	24.145	91	---	---	---	---
35	34.4	6	14.451	32.865	24.445	90	---	---	---	---
35	35.0	5	14.455	32.865	24.444	90	---	---	---	---
35	35.2	4	14.462	32.865	24.442	90	---	---	---	---
35	34.6	3	14.461	32.864	24.442	90	---	---	---	---
35	35.0	2	14.462	32.864	24.442	91	---	---	---	---
35	35.0	1	14.462	32.864	24.441	90	---	---	---	---

Date	Jun 29, 2006 12:24	Cruise:	S306	Latitude:	36.119	Year:	2006
Project:	CALCOFI	Station:	67-70	Longitude:	-123.504	Work week:	26
Platform:	MCARTHUR II	Cast:	12	Secchi Depth:	---	Day of Year:	180

\* Note: Latitude and Longitude are reported in decimal degrees. '---' signifies no data.

# Physical and Chemical

DEP (m)	PRESS (db)	BTL #	TEMP (°C)	SAL (psu)	SIGMA T	TRANSMISS (%)	NO3 (μM)	NO2 (μM)	PO4 (μM)	SIO4 (μM)
5	4.9	12	15.779	32.851	24.145	91	---	---	---	---
5	4.8	11	15.775	32.850	24.145	91	---	---	---	---
5	4.7	10	15.771	32.849	24.145	91	---	---	---	---
5	4.6	9	15.755	32.850	24.150	91	---	---	---	---
5	4.6	8	15.737	32.848	24.152	91	---	---	---	---
5	4.5	7	15.766	32.847	24.145	91	---	---	---	---
35	34.6	6	14.439	32.862	24.445	90	---	---	---	---
35	34.9	5	14.440	32.861	24.444	90	---	---	---	---
35	34.1	4	14.414	32.861	24.449	90	---	---	---	---
35	34.5	3	14.428	32.859	24.445	90	---	---	---	---
35	34.5	2	14.405	32.859	24.450	90	---	---	---	---
35	33.8	1	14.394	32.857	24.450	90	---	---	---	---

Date	Jun 29, 2006 13:39	Cruise:	S306	Latitude:	36.043	Year:	2006
Project:	CALCOFI	Station:	NPS5	Longitude:	-123.668	Work week:	26
Platform:	MCARTHUR II	Cast:	13	Secchi Depth:	---	Day of Year:	180

\* Note: Latitude and Longitude are reported in decimal degrees. '---' signifies no data.

### Physical and Chemical

DEP (m)	PRESS (db)	BTL #	TEMP (°C)	SAL (psu)	SIGMA T	TRANSMISS (%)	NO3 (μM)	NO2 (μM)	PO4 (μM)	SIO4 (μM)
0	0.7	12	15.790	32.819	24.117	91	0.123	0.025	0.161	2.310
50	50.1	11	11.653	32.741	24.901	92	5.039	0.135	0.498	4.792
100	100.2	10	10.100	33.551	25.806	92	21.236	0.031	1.343	19.905
200	201.5	9	8.506	34.029	26.438	93	29.466	0.027	1.931	36.002
300	302.7	8	7.653	34.124	26.641	93	33.197	0.021	2.317	49.147
400	402.9	7	6.625	34.166	26.818	93	36.182	0.014	2.466	62.622
500	504.0	6	5.892	34.203	26.942	93	38.655	0.014	2.666	75.897
600	604.8	5	5.308	34.274	27.070	93	40.521	0.002	2.854	89.396
700	705.7	4	4.821	34.332	27.172	93	41.867	0.002	2.891	99.514
800	807.1	3	4.575	34.392	27.248	93	42.346	0.011	2.949	101.66
900	908.6	2	4.166	34.428	27.321	93	---	---	---	---
1000	1010.7	1	3.852	34.454	27.375	93	42.813	0.001	2.901	123.12

Date: Jun 29, 2006 15:44      Cruise: S306      Latitude: 35.96      Year: 2006  
 Project: CALCOFI      Station: 67-75      Longitude: -123.843      Work week: 26  
 Platform: MCARTHUR II      Cast: 14      Secchi Depth: ---      Day of Year: 180

\* Note: Latitude and Longitude are reported in decimal degrees. '---' signifies no data.

### Physical and Chemical

DEP (m)	PRESS (db)	BTL #	TEMP (°C)	SAL (psu)	SIGMA T	TRANSMISS (%)	NO3 (μM)	NO2 (μM)	PO4 (μM)	SIO4 (μM)
0	1.2	12	16.130	32.865	24.076	91	0.058	0.000	0.155	2.312
5	5.7	11	15.905	32.835	24.104	91	0.049	0.003	0.210	2.251
10	10.3	10	15.704	32.830	24.145	91	0.018	0.017	0.151	1.403
20	19.4	9	14.828	32.883	24.378	90	0.177	0.054	0.241	0.668
30	30.2	8	14.095	32.908	24.552	91	1.044	0.149	0.206	0.369
40	40.5	7	13.743	32.892	24.613	91	2.474	0.275	0.507	1.742
60	61.4	6	11.656	33.125	25.198	92	12.990	0.094	1.043	11.914
80	81.1	5	10.185	33.574	25.809	92	21.857	0.052	1.702	21.268
100	100.5	4	9.843	33.720	25.980	92	24.301	0.033	1.721	25.104
150	151.2	3	9.230	33.980	26.286	92	28.256	0.033	2.081	32.356
200	201.6	2	8.723	34.062	26.430	93	---	---	---	---
1000	1010.3	1	3.936	34.459	27.370	93	42.802	0.035	3.179	120.86

### Biological

DEP (m)	BTL #	CHL (mg m-3 d-1)	PHAEO (mg m-3 d-1)	DEP (m)	% S. I.	CARBON (mg m-3 d-1)	PROD INDEX carbon/chl (mg m-3 d-1)	LIGHT DEPTH (m)
0	12	0.210	0.044	0	100	14.057	67.059	0
5	11	0.200	0.030	5	50	11.642	58.147	10
10	10	0.293	0.067	10	30	19.266	65.690	16
20	9	0.438	0.079	20	15	19.204	43.840	24
30	8	0.577	0.255	30	5	11.166	19.347	34
40	7	0.543	0.250	40	1	3.093	5.694	48
60	6	0.495	0.325	80	0.1	0.000	0.000	70
80	5	0.274	0.309					
100	4	0.094	0.170					
150	3	0.033	0.122					
200	2	0.013	0.078					
1000	1	0.003	0.017					

### Integrated Value

Integrated values are 1.0% of Surface Intensity (S.I.)

Chlorophyll <i>a</i> :	19.71	mg m-2 day -1	Carbon Fixation:	627.25	mg m-2 day-1
Phaeophytin:	6.62	mg m-2 day -1	Productivity Index:	31.82	mg C mg Chl day-1
Mixed Layer	14	meters	PBOpt:	67.06	mg C mg Chl day-1

Date	Jun 29, 2006 18:43	Cruise:	S306	Latitude:	35.877	Year:	2006
Project:	CALCOFI	Station:	NPS6	Longitude:	-124.017	Work week:	26
Platform:	MCARTHUR II	Cast:	15	Secchi Depth:	---	Day of Year:	180

\* Note: Latitude and Longitude are reported in decimal degrees. '---' signifies no data.

# Physical and Chemical

DEP (m)	PRESS (db)	BTL #	TEMP (°C)	SAL (psu)	SIGMA T	TRANSMISS (%)	NO3 (μM)	NO2 (μM)	PO4 (μM)	SIO4 (μM)
0	0.7	12	16.512	32.828	23.961	92	0.012	0.005	0.083	2.837
50	50.1	11	13.239	32.915	24.732	91	5.050	0.443	0.621	4.662
100	101.4	10	9.793	33.725	25.993	92	25.605	0.040	1.677	24.931
200	201.1	9	8.800	34.061	26.417	93	30.640	0.019	1.933	35.288
300	302.6	8	7.681	34.101	26.619	93	34.335	0.022	2.320	46.789
400	403.5	7	5.926	34.064	26.827	93	38.633	0.027	2.707	65.437
500	504.2	6	5.786	34.202	26.954	93	40.885	0.017	2.760	76.556
600	605.4	5	5.342	34.284	27.074	93	40.201	0.024	2.848	83.821
700	705.8	4	4.910	34.355	27.181	93	42.698	0.019	2.982	97.631
800	806.9	3	4.544	34.400	27.257	93	43.756	0.042	3.072	106.54
900	909.0	2	4.203	34.433	27.321	93	43.613	0.016	3.060	112.81
1000	1010.5	1	3.897	34.461	27.375	93	44.327	0.012	2.944	120.82



Date: Jun 29, 2006 20:40      Cruise: S306      Latitude: 35.794      Year: 2006  
 Project: CALCOFI      Station: 67-80      Longitude: -124.197      Work week: 26  
 Platform: MCARTHUR II      Cast: 16      Secchi Depth: ---      Day of Year: 180

\* Note: Latitude and Longitude are reported in decimal degrees. '---' signifies no data.

### Physical and Chemical

DEP (m)	PRESS (db)	BTL #	TEMP (°C)	SAL (psu)	SIGMA T	TRANSMISS (%)	NO3 (μM)	NO2 (μM)	PO4 (μM)	SIO4 (μM)
0	1.4	12	16.964	32.873	23.891	91	0.247	0.035	0.186	2.354
5	5.2	11	16.730	32.869	23.942	91	0.456	0.028	0.172	2.005
10	9.2	10	16.561	32.857	23.972	91	0.026	0.013	0.117	1.884
20	19.9	9	15.682	32.854	24.169	91	0.005	0.041	0.342	1.810
30	28.9	8	15.416	32.851	24.226	91	0.005	0.011	0.094	1.650
40	39.5	7	15.193	32.861	24.283	91	0.049	0.017	0.063	1.594
60	59.6	6	13.022	32.906	24.768	92	2.632	0.351	0.337	2.977
80	81.1	5	12.156	33.292	25.235	92	10.529	0.512	0.789	8.088
100	99.9	4	11.085	33.475	25.575	93	17.758	0.020	1.095	13.985
150	151.5	3	9.156	33.788	26.147	93	24.890	0.018	1.368	25.417
200	203.3	2	8.222	33.964	26.430	93	25.769	0.034	1.612	31.203
1000	1010.5	1	3.806	34.477	27.397	93	43.615	0.019	2.810	121.12

### Biological

DEP (m)	BTL #	CHL (mg m-3 d-1)	PHAEO (mg m-3 d-1)	DEP (m)	% S. I.	CARBON (mg m-3 d-1)	PROD INDEX carbon/chl (mg m-3 d-1)	LIGHT DEPTH (m)
0	12	0.148	0.026	0	100	12.535	84.940	0
5	11	0.152	0.024	10	50	13.084	84.876	12
10	10	0.154	0.044	20	30	13.094	54.412	19
20	9	0.241	0.068	20	15	13.596	56.501	28
30	8	0.333	0.120	40	5	10.004	22.406	40
40	7	0.447	0.158	60	1	2.457	5.075	56
60	6	0.484	0.260	80	0.1	0.000	0.000	81
80	5	0.102	0.186					
100	4	0.050	0.175					
1000	1	0.002	0.018					

### Integrated Value

Integrated values are 1.0% of Surface Intensity (S.I.)

Chlorophyll <i>a</i> :	16.87	mg m-2 day -1	Carbon Fixation:	607.42	mg m-2 day-1
Phaeophytin:	6.11	mg m-2 day -1	Productivity Index:	36.00	mg C mg Chl day-1
Mixed Layer	7	meters	PBOpt:	84.94	mg C mg Chl day-1

Date	Jun 29, 2006 23:12	Cruise:	S306	Latitude:	35.709	Year:	2006
Project:	CALCOFI	Station:	NPS7	Longitude:	-124.376	Work week:	26
Platform:	MCARTHUR II	Cast:	17	Secchi Depth:	---	Day of Year:	180

\* Note: Latitude and Longitude are reported in decimal degrees. '---' signifies no data.

# Physical and Chemical

DEP (m)	PRESS (db)	BTL #	TEMP (°C)	SAL (psu)	SIGMA T	TRANSMISS (%)	NO3 (μM)	NO2 (μM)	PO4 (μM)	SIO4 (μM)
0	0.7	12	17.025	32.849	23.858	91	0.016	0.025	0.085	2.601
50	49.6	11	13.203	33.035	24.832	92	4.878	0.449	0.646	5.121
100	100.3	10	11.322	33.486	25.541	93	17.430	0.702	1.247	13.662
200	200.6	9	8.767	33.932	26.322	93	27.179	0.043	1.793	30.604
300	302.4	8	7.249	34.029	26.623	93	33.528	0.099	2.150	47.532
400	402.7	7	6.319	34.124	26.824	93	38.256	0.054	2.603	64.161
500	502.9	6	5.763	34.214	26.966	93	40.274	0.019	2.612	77.353
600	605.1	5	5.321	34.294	27.084	93	41.636	0.021	2.957	88.262
700	706.8	4	4.863	34.346	27.179	93	43.014	0.021	2.956	98.113
800	806.8	3	4.494	34.392	27.257	93	43.885	0.019	2.840	107.35
900	909.7	2	4.121	34.430	27.328	93	44.105	0.047	2.967	114.33
1000	1010.2	1	3.834	34.465	27.385	93	44.472	0.028	3.025	122.04

Date: Jun 30, 2006 1:17      Cruise: S306      Latitude: 35.626      Year: 2006  
 Project: CALCOFI      Station: 67-85      Longitude: -124.552      Work week: 26  
 Platform: MCARTHUR II      Cast: 18      Secchi Depth: ---      Day of Year: 181

\* Note: Latitude and Longitude are reported in decimal degrees. '---' signifies no data.

### Physical and Chemical

DEP (m)	PRESS (db)	BTL #	TEMP (°C)	SAL (psu)	SIGMA T	TRANSMISS (%)	NO3 (μM)	NO2 (μM)	PO4 (μM)	SIO4 (μM)
0	1.8	12	16.885	32.843	23.887	91	0.235	0.066	0.167	2.291
5	4.8	11	16.791	32.840	23.906	92	0.013	0.017	0.077	2.089
10	9.7	10	15.930	32.837	24.101	91	0.017	0.015	0.124	2.006
20	19.2	9	15.811	32.838	24.129	91	0.013	0.029	0.075	1.863
30	30.5	8	15.747	32.835	24.140	91	0.012	0.029	0.048	1.798
40	39.1	7	15.690	32.834	24.153	91	0.122	0.029	0.121	1.859
60	60.5	6	13.510	32.918	24.680	92	2.768	0.266	0.283	3.920
80	79.7	5	12.711	33.121	24.996	93	10.981	0.582	0.701	8.566
100	100.8	4	12.116	33.323	25.268	93	11.020	0.577	0.775	8.510
150	152.5	3	9.989	33.673	25.921	92	23.277	0.047	1.506	22.117
200	201.8	2	8.603	33.949	26.360	93	---	---	---	---
1000	1010.4	1	3.859	34.460	27.379	93	44.334	0.030	2.738	120.51

### Biological

DEP (m)	BTL #	CHL (mg m-3 d-1)	PHAEO (mg m-3 d-1)	DEP (m)	% S. I.	CARBON (mg m-3 d-1)	PROD INDEX carbon/chl (mg m-3 d-1)	LIGHT DEPTH (m)
0	12	0.155	0.052	0	100	6.626	42.721	0
5	11	0.145	0.056	5	50	10.767	74.380	11
10	10	0.155	0.062	10	30	10.628	68.521	19
20	9	0.206	0.097	20	15	10.348	50.269	28
30	8	0.294	0.124	30	5	9.734	33.085	40
40	7	0.494	0.188	40	1	1.945	3.934	56
60	6	0.396	0.221	60	0.1	2.671	6.749	80
80	5	0.361	0.107					
100	4	0.060	0.071					
150	3	0.043	0.098					
200	2	0.036	0.153					
1000	1	0.004	0.021					

### Integrated Value

Integrated values are 1.0% of Surface Intensity (S.I.)

Chlorophyll <i>a</i> :	13.77	mg m-2 day -1	Carbon Fixation:	487.12	mg m-2 day-1
Phaeophytin:	5.60	mg m-2 day -1	Productivity Index:	35.38	mg C mg Chl day-1
Mixed Layer	11	meters	PBOpt:	74.38	mg C mg Chl day-1

Date	Jun 30, 2006 3:55	Cruise:	S306	Latitude:	35.544	Year:	2006
Project:	CALCOFI	Station:	NPS8	Longitude:	-124.729	Work week:	26
Platform:	MCARTHUR II	Cast:	19	Secchi Depth:	---	Day of Year:	181

\* Note: Latitude and Longitude are reported in decimal degrees. '---' signifies no data.

# Physical and Chemical

DEP (m)	PRESS (db)	BTL #	TEMP (°C)	SAL (psu)	SIGMA T	TRANSMISS (%)	NO3 (μM)	NO2 (μM)	PO4 (μM)	SIO4 (μM)
0	1.0	12	16.686	32.848	23.936	92	0.006	0.030	0.038	2.069
50	50.5	11	13.389	32.941	24.722	92	3.393	0.366	0.381	4.639
100	101.0	10	11.442	33.405	25.456	93	16.234	0.130	0.989	12.456
200	201.7	9	8.666	33.907	26.318	93	22.218	0.088	1.353	24.240
300	301.7	8	7.207	34.016	26.619	93	32.515	0.068	2.030	46.554
400	402.8	7	6.144	34.078	26.811	93	38.162	0.026	2.470	63.647
500	503.4	6	5.548	34.176	26.963	93	41.603	0.032	2.820	79.193
600	605.8	5	5.297	34.288	27.082	93	42.655	0.062	2.844	88.378
700	706.5	4	4.869	34.351	27.182	93	43.656	0.024	2.868	98.584
800	807.3	3	4.499	34.396	27.260	93	44.340	0.040	2.765	106.64
900	909.2	2	4.127	34.430	27.326	93	---	---	---	---
1000	1010.1	1	3.843	34.464	27.384	93	44.644	0.039	2.714	121.75

Date: Jun 30, 2006 6:01      Cruise: S306      Latitude: 35.462      Year: 2006  
 Project: CALCOFI      Station: 67-90      Longitude: -124.907      Work week: 26  
 Platform: MCARTHUR II      Cast: 20      Secchi Depth: ---      Day of Year: 181

\* Note: Latitude and Longitude are reported in decimal degrees. '---' signifies no data.

### Physical and Chemical

DEP (m)	PRESS (db)	BTL #	TEMP (°C)	SAL (psu)	SIGMA T	TRANSMISS (%)	NO3 (μM)	NO2 (μM)	PO4 (μM)	SIO4 (μM)
0	0.8	12	16.809	32.845	23.905	92	0.201	0.038	0.021	2.314
5	4.3	11	16.789	32.845	23.910	92	0.002	0.032	0.074	2.221
10	10.3	10	16.797	32.841	23.905	92	0.226	0.032	0.041	2.088
20	20.1	9	15.592	32.811	24.156	91	0.001	0.009	0.068	2.267
30	30.4	8	15.226	32.785	24.216	91	0.264	0.032	0.154	2.261
40	41.1	7	14.661	32.918	24.441	91	0.273	0.054	0.056	1.132
50	48.2	6	13.447	32.914	24.689	91	1.656	0.244	0.182	2.990
60	60.5	5	12.737	33.040	24.928	91	6.757	0.807	0.473	5.760
80	80.0	4	11.842	33.352	25.341	93	10.985	0.578	0.741	7.906
100	100.6	3	10.825	33.533	25.666	93	19.778	0.433	1.294	17.323
150	151.1	2	8.860	33.795	26.199	93	23.879	0.048	1.407	24.671
200	201.8	1	8.255	33.979	26.437	93	27.413	0.046	1.777	32.958

### Biological

DEP (m)	BTL #	CHL (mg m-3 d-1)	PHAEO (mg m-3 d-1)	DEP (m)	% S. I.	CARBON (mg m-3 d-1)	PROD INDEX carbon/chl (mg m-3 d-1)	LIGHT DEPTH (m)
0	12	0.117	0.028	0	100	7.408	63.553	0
5	11	0.117	0.041	5	50	8.534	73.213	13
10	10	0.130	0.033	10	30	9.194	70.880	21
20	9	0.167	0.042	20	15	10.442	62.405	31
30	8	0.232	0.062	30	5	5.211	22.446	42
40	7	0.611	0.164	40	1	2.810	4.600	57
50	6	0.624	0.182	60	0.1	0.000	0.000	86
60	5	0.446	0.195					
80	4	0.055	0.114					
100	3	0.074	0.193					
150	2	0.037	0.146					
200	1	0.018	0.095					

### Integrated Value

Integrated values are 1.0% of Surface Intensity (S.I.)

Chlorophyll <i>a</i> :	12.59	mg m-2 day -1	Carbon Fixation:	422.60	mg m-2 day-1
Phaeophytin:	3.41	mg m-2 day -1	Productivity Index:	33.57	mg C mg Chl day-1
Mixed Layer	12	meters	PBOpt:	73.21	mg C mg Chl day-1

Date	Jun 30, 2006 6:54	Cruise:	S306	Latitude:	35.458	Year:	2006
Project:	CALCOFI	Station:	67-90	Longitude:	-124.91	Work week:	26
Platform:	MCARTHUR II	Cast:	21	Secchi Depth:	---	Day of Year:	181

\* Note: Latitude and Longitude are reported in decimal degrees. '---' signifies no data.

# Physical and Chemical

DEP (m)	PRESS (db)	BTL #	TEMP (°C)	SAL (psu)	SIGMA T	TRANSMISS (%)	NO3 (μM)	NO2 (μM)	PO4 (μM)	SIO4 (μM)
300	302.8	12	7.125	34.099	26.696	93	35.328	0.002	2.023	51.979
400	404.2	11	5.808	34.078	26.853	93	37.828	0.002	2.381	67.849
500	505.4	10	5.288	34.175	26.993	93	39.203	0.008	2.674	82.455
600	605.3	9	4.912	34.265	27.108	93	41.681	0.011	2.751	89.653
700	708.0	8	4.799	34.369	27.205	93	42.935	0.008	2.848	96.781
800	808.0	7	4.456	34.404	27.270	93	43.685	0.006	2.974	106.29
900	908.1	6	4.118	34.440	27.335	93	40.119	0.096	2.680	106.88
1000	1010.1	5	3.794	34.466	27.390	93	40.692	0.001	2.797	121.08
1250	1263.4	4	3.246	34.524	27.491	93	41.683	0.014	2.798	133.33
1500	1517.0	3	2.782	34.561	27.564	93	43.630	0.021	2.869	147.55
2000	2024.7	2	2.108	34.620	27.669	93	41.767	0.019	2.770	163.75
2500	2531.8	1	1.792	34.650	27.721	93	38.683	0.005	2.520	168.77

Date	Jun 30, 2006 9:07	Cruise:	S306	Latitude:	35.459	Year:	2006
Project:	CALCOFI	Station:	67-90	Longitude:	-124.906	Work week:	26
Platform:	MCARTHUR II	Cast:	22	Secchi Depth:	---	Day of Year:	181

\* Note: Latitude and Longitude are reported in decimal degrees. '---' signifies no data.

# Physical and Chemical

DEP (m)	PRESS (db)	BTL #	TEMP (°C)	SAL (psu)	SIGMA T	TRANSMISS (%)	NO3 (µM)	NO2 (µM)	PO4 (µM)	SIO4 (µM)
5	4.7	12	16.788	32.852	23.916	92	---	---	---	---
5	4.5	11	16.780	32.852	23.918	92	---	---	---	---
5	4.3	10	16.782	32.851	23.917	92	---	---	---	---
5	4.7	9	16.777	32.851	23.918	92	---	---	---	---
5	4.5	8	16.777	32.851	23.918	92	---	---	---	---
5	4.3	7	16.783	32.851	23.916	92	---	---	---	---
40	40.5	6	15.177	32.819	24.254	91	---	---	---	---
40	40.2	5	15.186	32.818	24.251	91	---	---	---	---
40	40.2	4	15.184	32.818	24.252	91	---	---	---	---
40	40.0	3	15.183	32.818	24.252	91	---	---	---	---
40	40.0	2	15.180	32.818	24.253	91	---	---	---	---
40	40.5	1	15.168	32.820	24.256	91	---	---	---	---

Date	Jun 30, 2006 9:58	Cruise:	S306	Latitude:	35.47	Year:	2006
Project:	CALCOFI	Station:	67-90	Longitude:	-124.931	Work week:	26
Platform:	MCARTHUR II	Cast:	23	Secchi Depth:	---	Day of Year:	181

\* Note: Latitude and Longitude are reported in decimal degrees. '---' signifies no data.

# Physical and Chemical

DEP (m)	PRESS (db)	BTL #	TEMP (°C)	SAL (psu)	SIGMA T	TRANSMISS (%)	NO3 (μM)	NO2 (μM)	PO4 (μM)	SIO4 (μM)
0	3.3	7	16.676	32.847	23.938	92	---	---	---	---
5	3.9	12	16.685	32.849	23.938	92	---	---	---	---
5	3.6	11	16.685	32.849	23.937	92	---	---	---	---
5	3.7	10	16.684	32.849	23.937	92	---	---	---	---
5	3.6	9	16.684	32.848	23.937	92	---	---	---	---
5	3.7	8	16.676	32.848	23.939	92	---	---	---	---
50	49.7	6	13.364	32.964	24.745	91	---	---	---	---
50	49.9	5	13.355	32.962	24.745	91	---	---	---	---
50	49.4	4	13.443	32.954	24.721	91	---	---	---	---
50	50.1	3	13.308	32.961	24.754	91	---	---	---	---
50	49.7	2	13.406	32.958	24.732	91	---	---	---	---
50	49.9	1	13.343	32.961	24.747	91	---	---	---	---



Date: Jun 30, 2006 11:59      Cruise: S306      Latitude: 35.705      Year: 2006  
 Project: CALCOFI      Station: 65.25-90      Longitude: -125.089      Work week: 26  
 Platform: MCARTHUR II      Cast: 24      Secchi Depth: ---      Day of Year: 181

\* Note: Latitude and Longitude are reported in decimal degrees. '---' signifies no data.

### Physical and Chemical

DEP (m)	PRESS (db)	BTL #	TEMP (°C)	SAL (psu)	SIGMA T	TRANSMISS (%)	NO3 (μM)	NO2 (μM)	PO4 (μM)	SIO4 (μM)
0	2.1	12	16.341	32.890	24.048	92	0.053	0.033	0.123	2.205
10	9.5	11	15.554	32.863	24.204	92	0.053	0.017	0.040	1.820
20	19.9	10	15.363	32.884	24.263	91	0.028	0.006	0.083	1.102
40	39.6	9	14.163	32.836	24.483	92	0.196	0.053	0.128	0.779
60	60.2	8	12.526	32.891	24.853	92	2.758	0.382	0.410	2.653
80	79.7	7	12.156	33.362	25.289	93	9.957	0.310	0.887	7.161
100	100.8	6	10.383	33.451	25.679	93	17.692	0.079	1.053	14.094
200	201.3	5	8.544	33.985	26.398	93	27.670	0.019	1.575	31.832
400	403.0	4	6.349	34.135	26.829	93	34.370	0.058	2.271	59.413
600	603.3	3	5.148	34.258	27.076	93	42.265	0.015	2.830	88.790
800	806.9	2	4.430	34.390	27.262	93	43.882	0.043	2.946	97.512
1000	1011.2	1	3.892	34.470	27.383	93	40.278	0.013	2.647	112.88

### Biological

DEP (m)	BTL #	CHL (mg m-3 d-1)	PHAEO (mg m-3 d-1)	DEP (m)	% S. I.	CARBON (mg m-3 d-1)	PROD INDEX carbon/chl (mg m-3 d-1)	LIGHT DEPTH (m)
0	12	0.144	0.034	0	100	14.620	101.655	0
10	11	0.196	0.068	10	50	10.609	54.261	11
20	10	0.393	0.131	10	30	10.348	52.928	17
40	9	0.369	0.126	20	15	20.930	53.267	25
60	8	0.275	0.132	20	5	11.949	30.411	37
80	7	0.131	0.105	40	1	2.652	7.180	56
100	6	0.071	0.117	60	0.1	0.484	1.757	87
200	5	0.011	0.043					

### Integrated Value

Integrated values are 1.0% of Surface Intensity (S.I.)

Chlorophyll <i>a</i> :	17.22	mg m-2 day -1	Carbon Fixation:	660.30	mg m-2 day-1
Phaeophytin:	5.73	mg m-2 day -1	Productivity Index:	38.34	mg C mg Chl day-1
Mixed Layer	11	meters	PBOpt:	101.65	mg C mg Chl day-1

Date: Jun 30, 2006 15:13      Cruise: S306      Latitude: 36.008      Year: 2006  
 Project: CALCOFI      Station: 63.5-90      Longitude: -125.316      Work week: 26  
 Platform: MCARTHUR II      Cast: 25      Secchi Depth: ---      Day of Year: 181

\* Note: Latitude and Longitude are reported in decimal degrees. '---' signifies no data.

### Physical and Chemical

DEP (m)	PRESS (db)	BTL #	TEMP (°C)	SAL (psu)	SIGMA T	TRANSMISS (%)	NO3 (μM)	NO2 (μM)	PO4 (μM)	SIO4 (μM)
0	1.9	12	16.466	32.892	24.021	92	0.225	0.042	0.092	2.576
10	9.7	11	16.400	32.888	24.033	92	0.016	0.010	0.090	2.523
20	20.1	10	15.952	32.875	24.125	91	0.045	0.011	0.075	2.413
40	41.4	9	15.831	32.894	24.167	91	0.007	0.001	0.018	2.313
60	60.4	8	13.155	32.932	24.762	89	0.399	0.047	0.072	3.835
80	80.0	7	10.598	33.327	25.545	92	16.426	0.009	1.032	13.174
100	101.8	6	9.700	33.692	25.983	93	23.863	0.027	1.760	22.555
200	201.6	5	8.485	34.052	26.459	93	30.303	0.004	2.129	49.689
400	402.7	4	6.448	34.162	26.838	93	38.544	0.005	2.724	64.573
600	605.9	3	5.130	34.282	27.097	93	41.886	0.021	2.857	90.838
800	808.6	2	4.488	34.407	27.269	93	44.128	0.002	3.094	104.65
1000	1012.1	1	3.847	34.470	27.388	93	44.622	0.002	2.918	120.35

### Biological

DEP (m)	BTL #	CHL (mg m-3 d-1)	PHAEO (mg m-3 d-1)	DEP (m)	% S. I.	CARBON (mg m-3 d-1)	PROD INDEX carbon/chl (mg m-3 d-1)	LIGHT DEPTH (m)
0	12	0.123	0.016	0	100	7.650	62.122	0
10	11	0.137	0.018	10	50	7.650	55.969	13
20	10	0.194	0.040	10	30	7.501	54.880	21
40	9	0.306	0.088	20	15	7.203	37.198	30
60	8	0.921	0.358	40	5	6.952	22.685	43
80	7	0.274	0.190	60	1	5.807	6.304	58
100	6	0.033	0.041	80	0.1	0.223	0.814	78
200	5	0.009	0.011					

### Integrated Value

Integrated values are 1.0% of Surface Intensity (S.I.)

Chlorophyll <i>a</i> :	16.42	mg m-2 day -1	Carbon Fixation:	378.94	mg m-2 day-1
Phaeophytin:	4.67	mg m-2 day -1	Productivity Index:	23.08	mg C mg Chl day-1
Mixed Layer	19	meters	PBOpt:	62.12	mg C mg Chl day-1

Date: Jun 30, 2006 18:46      Cruise: S306      Latitude: 36.312      Year: 2006  
 Project: CALCOFI      Station: 61.75-90      Longitude: -125.542      Work week: 26  
 Platform: MCARTHUR II      Cast: 26      Secchi Depth: ---      Day of Year: 181

\* Note: Latitude and Longitude are reported in decimal degrees. '---' signifies no data.

### Physical and Chemical

DEP (m)	PRESS (db)	BTL #	TEMP (°C)	SAL (psu)	SIGMA T	TRANSMISS (%)	NO3 (μM)	NO2 (μM)	PO4 (μM)	SIO4 (μM)
0	1.4	12	16.271	32.890	24.064	91	0.007	0.012	0.269	2.799
10	9.2	11	16.249	32.890	24.069	91	0.001	0.021	0.161	2.500
20	20.6	10	16.037	32.901	24.126	91	0.006	0.000	0.047	2.379
40	40.2	9	15.799	32.882	24.165	91	0.136	0.000	0.049	2.686
60	60.6	8	11.908	33.244	25.244	91	12.644	0.127	0.860	11.044
80	80.5	7	9.804	33.573	25.872	93	20.782	0.036	1.401	18.360
100	99.4	6	9.356	33.749	26.083	93	25.495	0.004	1.503	24.921
200	200.7	5	7.753	34.009	26.535	93	28.579	0.025	1.770	37.132
400	403.1	4	6.315	34.170	26.861	93	38.837	0.036	2.630	65.910
600	606.1	3	5.107	34.280	27.098	93	42.582	0.004	2.862	90.539
800	807.9	2	4.476	34.408	27.272	93	43.926	0.010	2.941	106.37
1000	1010.4	1	3.865	34.469	27.386	93	40.609	0.005	2.972	117.68

### Biological

DEP (m)	BTL #	CHL (mg m-3 d-1)	PHAEO (mg m-3 d-1)	DEP (m)	% S. I.	CARBON (mg m-3 d-1)	PROD INDEX carbon/chl (mg m-3 d-1)	LIGHT DEPTH (m)
0	12	0.153	0.020	0	100	7.119	46.464	0
10	11	0.165	0.032	10	50	8.701	52.595	12
20	10	0.167	0.084	10	30	8.590	51.920	20
40	9	0.408	0.128	20	15	8.562	51.169	28
60	8	0.491	0.256	40	5	9.706	23.792	41
80	7	0.122	0.062	40	1	2.783	6.821	58
100	6	0.014	0.047	80	0.1	0.140	1.142	86
200	5	0.026	0.000					
400	4	0.015	0.004					
600	3	0.011	0.003					
1000	1	0.003	0.005					

### Integrated Value

Integrated values are 1.0% of Surface Intensity (S.I.)

Chlorophyll <i>a</i> :	14.97	mg m-2 day -1	Carbon Fixation:	456.09	mg m-2 day-1
Phaeophytin:	4.52	mg m-2 day -1	Productivity Index:	30.47	mg C mg Chl day-1
Mixed Layer	42	meters	PBOpt:	52.59	mg C mg Chl day-1

Date: Jun 30, 2006 21:52      Cruise: S306      Latitude: 36.613      Year: 2006  
 Project: CALCOFI      Station: 60-90      Longitude: -125.771      Work week: 26  
 Platform: MCARTHUR II      Cast: 27      Secchi Depth: ---      Day of Year: 181

\* Note: Latitude and Longitude are reported in decimal degrees. '---' signifies no data.

### Physical and Chemical

DEP (m)	PRESS (db)	BTL #	TEMP (°C)	SAL (psu)	SIGMA T	TRANSMISS (%)	NO3 (μM)	NO2 (μM)	PO4 (μM)	SIO4 (μM)
0	1.6	12	15.995	32.793	24.052	92	0.147	0.011	0.030	2.993
10	9.7	11	15.965	32.792	24.058	92	0.031	0.010	0.179	2.781
20	19.3	10	15.923	32.791	24.067	92	0.485	0.024	0.241	3.582
40	40.1	9	15.193	32.778	24.219	90	0.619	0.022	0.096	3.421
60	59.8	8	10.840	33.026	25.268	92	12.529	0.041	0.786	11.140
80	80.5	7	10.155	33.288	25.590	92	19.146	0.003	1.117	16.547
100	101.5	6	9.647	33.623	25.937	93	23.287	0.017	1.591	21.168
500	504.0	5	5.633	34.216	26.984	93	36.099	0.002	2.598	75.129
1000	1009.6	4	3.822	34.458	27.381	93	44.092	0.010	2.919	120.54
2000	2024.4	3	2.102	34.611	27.663	93	36.429	0.006	2.653	158.77
3000	3045.0	2	1.640	34.665	27.748	93	38.907	0.043	2.628	168.73
4000	4068.6	1	1.507	34.688	27.782	93	37.648	0.009	2.453	166.78

### Biological

DEP (m)	BTL #	CHL (mg m-3 d-1)	PHAEO (mg m-3 d-1)	DEP (m)	% S. I.	CARBON (mg m-3 d-1)	PROD INDEX carbon/chl (mg m-3 d-1)	LIGHT DEPTH (m)
0	12	0.105	0.017	0	100	4.309	40.927	0
10	11	0.102	0.012	10	50	2.038	19.891	14
20	10	0.114	0.023	10	30	5.909	57.675	22
40	9	0.677	0.220	20	15	8.645	76.011	30
60	8	0.444	0.190	40	5	20.483	30.264	42
80	7	0.210	0.132	60	1	3.825	8.621	57
100	6	0.062	0.059	80	0.1	0.354	1.687	83

### Integrated Value

Integrated values are 1.0% of Surface Intensity (S.I.)

Chlorophyll <i>a</i> :	16.13	mg m-2 day -1	Carbon Fixation:	485.15	mg m-2 day-1
Phaeophytin:	4.92	mg m-2 day -1	Productivity Index:	30.08	mg C mg Chl day-1
Mixed Layer	24	meters	PBOpt:	76.01	mg C mg Chl day-1

Date Jul 01, 2006 3:14 Cruise: S306 Latitude: 36.781 Year: 2006  
 Project: CALCOFI Station: 60-85 Longitude: -125.412 Work week: 26  
 Platform: MCARTHUR II Cast: 28 Secchi Depth: --- Day of Year: 182

\* Note: Latitude and Longitude are reported in decimal degrees. '---' signifies no data.

### Physical and Chemical

DEP (m)	PRESS (db)	BTL #	TEMP (°C)	SAL (psu)	SIGMA T	TRANSMISS (%)	NO3 (μM)	NO2 (μM)	PO4 (μM)	SIO4 (μM)
0	1.4	12	15.888	32.829	24.103	92	0.096	0.080	0.063	2.493
10	9.8	11	15.887	32.827	24.102	92	0.064	0.033	0.067	2.110
20	19.5	10	15.881	32.827	24.104	92	0.194	0.076	0.140	2.034
40	39.9	9	14.836	32.806	24.318	91	0.359	0.078	0.194	0.998
60	61.2	8	12.031	33.081	25.095	91	9.389	0.266	0.715	8.097
80	80.1	7	10.749	33.394	25.571	92	18.774	0.084	1.252	15.410
100	100.9	6	9.774	33.594	25.894	92	22.901	0.076	1.481	20.897
200	201.2	5	8.311	34.006	26.450	93	27.619	0.067	1.826	31.978
400	402.8	4	6.283	34.160	26.857	93	37.866	0.134	2.540	62.430
600	605.3	3	5.095	34.268	27.090	93	39.062	0.061	2.760	82.545
800	807.7	2	4.393	34.388	27.265	93	39.176	0.002	2.780	76.721
1000	1010.6	1	3.814	34.460	27.384	93	40.537	0.005	2.833	118.27

### Biological

DEP (m)	BTL #	CHL (mg m-3 d-1)	PHAEO (mg m-3 d-1)	DEP (m)	% S. I.	CARBON (mg m-3 d-1)	PROD INDEX carbon/chl (mg m-3 d-1)	LIGHT DEPTH (m)
0	12	0.149	0.033	0	100	7.482	50.061	0
10	11	0.140	0.036	10	50	4.988	35.614	12
20	10	0.192	0.048	10	30	11.949	85.314	20
40	9	0.538	0.131	20	15	14.573	75.998	28
60	8	0.537	0.263	40	5	17.700	32.920	41
80	7	0.265	0.223	60	1	6.161	11.478	56
100	6	0.059	0.076	80	0.1	0.475	1.790	79
200	5	0.012	0.087					

### Integrated Value

Integrated values are 1.0% of Surface Intensity (S.I.)

Chlorophyll <i>a</i> :	16.94	mg m-2 day -1	Carbon Fixation:	634.07	mg m-2 day-1
Phaeophytin:	5.16	mg m-2 day -1	Productivity Index:	37.43	mg C mg Chl day-1
Mixed Layer	26	meters	PBOpt:	85.31	mg C mg Chl day-1

Date Jul 01, 2006 6:37 Cruise: S306 Latitude: 36.946 Year: 2006  
 Project: CALCOFI Station: 60-80 Longitude: -125.057 Work week: 26  
 Platform: MCARTHUR II Cast: 29 Secchi Depth: --- Day of Year: 182

\* Note: Latitude and Longitude are reported in decimal degrees. '---' signifies no data.

### Physical and Chemical

DEP (m)	PRESS (db)	BTL #	TEMP (°C)	SAL (psu)	SIGMA T	TRANSMISS (%)	NO3 (μM)	NO2 (μM)	PO4 (μM)	SIO4 (μM)
0	1.1	12	15.640	32.804	24.140	91	0.004	0.036	0.150	2.359
10	9.6	11	15.628	32.802	24.141	91	0.013	0.007	0.232	2.171
20	20.2	10	14.809	32.819	24.333	91	0.018	0.015	0.355	1.240
40	40.9	9	14.442	32.846	24.432	91	0.184	0.092	0.289	1.663
60	60.5	8	12.330	32.683	24.729	92	2.282	0.643	0.318	3.123
80	80.2	7	11.329	32.750	24.967	93	6.939	0.081	0.649	6.146
100	100.4	6	10.378	33.112	25.416	93	16.283	0.050	1.116	14.469
200	202.5	5	8.357	33.953	26.401	93	28.072	0.029	1.622	32.395
400	403.5	4	5.871	34.049	26.822	93	38.373	0.031	2.334	64.391
600	605.2	3	4.877	34.237	27.090	93	42.965	0.025	2.800	92.780
800	807.7	2	4.315	34.359	27.250	93	44.099	0.019	3.016	104.83
1000	1009.6	1	3.761	34.460	27.389	93	44.141	0.164	3.028	113.25

### Biological

DEP (m)	BTL #	CHL (mg m-3 d-1)	PHAEO (mg m-3 d-1)	DEP (m)	% S. I.	CARBON (mg m-3 d-1)	PROD INDEX carbon/chl (mg m-3 d-1)	LIGHT DEPTH (m)
0	12	0.149	0.018	0	100	6.244	42.044	0
10	11	0.051	0.006	10	50	10.162	200.702	15
20	10	0.085	0.010	10	30	9.204	181.771	24
40	9	0.622	0.124	20	15	17.179	201.853	32
60	8	0.461	0.244	40	5	20.557	33.036	44
80	7	0.120	0.073	60	1	4.262	9.254	60
100	6	0.048	0.054	80	0.1	0.186	1.547	90
200	5	0.017	0.043					

### Integrated Value

Integrated values are 1.0% of Surface Intensity (S.I.)

Chlorophyll <i>a</i> :	15.05	mg m-2 day -1	Carbon Fixation:	734.65	mg m-2 day-1
Phaeophytin:	3.92	mg m-2 day -1	Productivity Index:	48.82	mg C mg Chl day-1
Mixed Layer	16	meters	PBOpt:	201.85	mg C mg Chl day-1

Date: Jul 01, 2006 10:10      Cruise: S306      Latitude: 37.114      Year: 2006  
 Project: CALCOFI      Station: 60-75      Longitude: -124.69      Work week: 26  
 Platform: MCARTHUR II      Cast: 30      Secchi Depth: ---      Day of Year: 182

\* Note: Latitude and Longitude are reported in decimal degrees. '---' signifies no data.

### Physical and Chemical

DEP (m)	PRESS (db)	BTL #	TEMP (°C)	SAL (psu)	SIGMA T	TRANSMISS (%)	NO3 (μM)	NO2 (μM)	PO4 (μM)	SIO4 (μM)
0	2.4	12	15.394	32.738	24.143	92	0.010	0.024	0.018	1.778
10	9.7	11	15.389	32.738	24.144	92	0.000	0.022	0.048	1.438
20	19.8	10	15.020	32.732	24.220	91	0.025	0.047	0.137	1.422
40	41.0	9	14.862	32.734	24.257	91	0.037	0.038	0.185	1.332
60	59.3	8	13.698	32.843	24.584	92	4.069	0.310	0.495	5.040
80	80.0	7	10.973	33.198	25.379	93	15.481	0.067	0.862	12.545
100	100.1	6	9.966	33.545	25.823	93	22.612	0.075	1.496	20.456
200	202.5	5	7.975	34.002	26.497	93	30.769	0.043	1.995	39.150
400	403.8	4	5.916	34.105	26.861	93	38.539	0.066	2.793	70.175
600	605.9	3	4.806	34.232	27.094	93	42.537	0.073	2.980	96.501
800	808.9	2	4.346	34.389	27.270	93	43.417	0.056	2.897	111.89
1000	1009.9	1	3.774	34.464	27.390	93	43.553	0.049	2.964	125.03

### Biological

DEP (m)	BTL #	CHL (mg m-3 d-1)	PHAEO (mg m-3 d-1)	DEP (m)	% S. I.	CARBON (mg m-3 d-1)	PROD INDEX carbon/chl (mg m-3 d-1)	LIGHT DEPTH (m)
0	12	0.108	0.007	0	100	4.030	37.276	0
10	11	0.115	0.011	10	50	7.240	63.134	14
20	10	0.196	0.019	10	30	8.143	71.005	22
40	9	0.401	0.064	20	15	8.162	41.743	31
60	8	0.386	0.085	40	5	8.794	21.910	45
80	7	0.180	0.076	60	1	3.127	8.094	63
100	6	0.096	0.056	80	0.1	0.233	1.296	96
200	5	0.010	0.036					

### Integrated Value

Integrated values are 1.0% of Surface Intensity (S.I.)

Chlorophyll <i>a</i> :	15.36	mg m-2 day -1	Carbon Fixation:	442.91	mg m-2 day-1
Phaeophytin:	2.32	mg m-2 day -1	Productivity Index:	28.83	mg C mg Chl day-1
Mixed Layer	22	meters	PBOpt:	71.01	mg C mg Chl day-1

Date Jul 01, 2006 13:50 Cruise: S306 Latitude: 37.281 Year: 2006  
 Project: CALCOFI Station: 60-70 Longitude: -124.332 Work week: 26  
 Platform: MCARTHUR II Cast: 31 Secchi Depth: --- Day of Year: 182

\* Note: Latitude and Longitude are reported in decimal degrees. '---' signifies no data.

### Physical and Chemical

DEP (m)	PRESS (db)	BTL #	TEMP (°C)	SAL (psu)	SIGMA T	TRANSMISS (%)	NO3 (μM)	NO2 (μM)	PO4 (μM)	SIO4 (μM)
0	1.4	12	14.960	32.841	24.317	90	0.045	0.011	0.072	2.306
10	9.7	11	14.961	32.841	24.317	90	0.073	0.055	0.323	2.102
20	20.6	10	14.963	32.838	24.314	90	0.388	0.049	0.113	1.763
40	40.6	9	12.846	33.033	24.901	88	8.080	0.282	0.315	4.737
60	59.9	8	9.916	33.481	25.781	92	21.214	0.017	1.275	21.254
80	80.6	7	9.409	33.612	25.967	92	23.447	0.038	1.341	24.314
100	101.0	6	8.985	33.785	26.171	92	26.037	0.025	1.580	28.268
200	200.6	5	7.896	34.050	26.546	93	32.462	0.020	1.989	42.302
400	403.4	4	5.947	34.126	26.873	93	38.359	0.027	2.480	70.714
600	609.8	3	4.745	34.229	27.098	93	42.140	0.014	3.003	96.495
800	805.7	2	4.224	34.363	27.263	93	43.192	0.024	3.197	112.58
1000	1010.8	1	3.751	34.461	27.391	93	43.635	0.021	3.163	125.43

### Biological

DEP (m)	BTL #	CHL (mg m-3 d-1)	PHAEO (mg m-3 d-1)	DEP (m)	% S. I.	CARBON (mg m-3 d-1)	PROD INDEX carbon/chl (mg m-3 d-1)	LIGHT DEPTH (m)
0	12	0.373	0.006	0	100	10.395	27.855	0
10	11	0.385	0.006	10	50	19.562	50.757	9
20	10	0.409	0.011	10	30	20.101	52.157	15
40	9	1.673	0.128	20	15	22.307	54.553	22
60	8	0.129	0.144	20	5	12.526	30.634	31
80	7	0.066	0.134	40	1	11.167	6.674	44
100	6	0.041	0.089	60	0.1	0.047	0.361	64
200	5	0.009	0.069					

### Integrated Value

Integrated values are 1.0% of Surface Intensity (S.I.)

Chlorophyll <i>a</i> :	25.46	mg m-2 day -1	Carbon Fixation:	710.26	mg m-2 day-1
Phaeophytin:	1.13	mg m-2 day -1	Productivity Index:	27.89	mg C mg Chl day-1
Mixed Layer	31	meters	PBOpt:	54.55	mg C mg Chl day-1



Date Jul 01, 2006 17:38 Cruise: S306 Latitude: 37.448 Year: 2006  
 Project: CALCOFI Station: 60-65 Longitude: -123.97 Work week: 26  
 Platform: MCARTHUR II Cast: 32 Secchi Depth: --- Day of Year: 182

\* Note: Latitude and Longitude are reported in decimal degrees. '---' signifies no data.

### Physical and Chemical

DEP (m)	PRESS (db)	BTL #	TEMP (°C)	SAL (psu)	SIGMA T	TRANSMISS (%)	NO3 (μM)	NO2 (μM)	PO4 (μM)	SIO4 (μM)
0	0.7	12	14.972	32.827	24.303	90	0.110	0.036	0.039	2.561
10	10.6	11	14.946	32.825	24.308	90	0.175	0.034	0.085	2.240
20	20.0	10	14.119	32.877	24.523	89	1.191	0.126	0.233	1.679
40	39.8	9	12.588	32.923	24.866	91	6.071	0.362	0.414	5.054
60	60.9	8	10.161	33.211	25.529	92	18.072	0.032	1.044	16.296
80	80.4	7	9.455	33.548	25.910	92	23.211	0.045	1.277	22.414
100	100.0	6	9.155	33.702	26.079	92	25.445	0.017	1.607	26.618
200	201.3	5	7.954	34.005	26.502	93	30.869	0.028	1.722	40.090
400	402.2	4	6.240	34.190	26.886	93	38.190	0.036	2.556	70.447
600	605.2	3	5.062	34.280	27.103	93	39.067	0.033	2.771	90.979
800	806.6	2	4.421	34.394	27.266	93	42.180	0.008	3.028	108.85
1000	1011.3	1	3.789	34.464	27.389	93	43.309	0.034	3.027	125.04

### Biological

DEP (m)	BTL #	CHL (mg m-3 d-1)	PHAEO (mg m-3 d-1)	DEP (m)	% S. I.	CARBON (mg m-3 d-1)	PROD INDEX carbon/chl (mg m-3 d-1)	LIGHT DEPTH (m)
0	12	0.354	0.000	0	100	9.102	25.684	0
10	11	0.353	0.066	10	50	19.568	55.364	9
20	10	0.893	0.064	10	30	22.290	63.066	14
40	9	0.780	0.168	20	15	35.087	39.291	21
60	8	0.099	0.113	20	5	25.335	28.371	30
80	7	0.039	0.083	40	1	7.359	9.432	44
100	6	0.020	0.056	60	0.1	0.162	1.646	74
200	5	0.013	0.049					

### Integrated Value

Integrated values are 1.0% of Surface Intensity (S.I.)

Chlorophyll <i>a</i> :	29.35	mg m-2 day -1	Carbon Fixation:	938.98	mg m-2 day-1
Phaeophytin:	3.33	mg m-2 day -1	Productivity Index:	32.00	mg C mg Chl day-1
Mixed Layer	27	meters	PBOpt:	63.07	mg C mg Chl day-1

Date	Jul 01, 2006 20:12	Cruise:	S306	Latitude:	37.531	Year:	2006
Project:	CALCOFI	Station:	60-62.5	Longitude:	-123.789	Work week:	26
Platform:	MCARTHUR II	Cast:	33	Secchi Depth:	---	Day of Year:	182

\* Note: Latitude and Longitude are reported in decimal degrees. '---' signifies no data.

# Physical and Chemical

DEP (m)	PRESS (db)	BTL #	TEMP (°C)	SAL (psu)	SIGMA T	TRANSMISS (%)	NO3 (μM)	NO2 (μM)	PO4 (μM)	SIO4 (μM)
0	2.0	12	15.018	32.824	24.291	90	0.000	0.004	0.026	2.565
10	9.8	11	14.974	32.824	24.301	90	0.042	0.028	0.066	2.363
20	20.2	10	14.833	32.824	24.331	90	0.015	0.023	0.085	2.157
40	39.6	9	12.624	32.785	24.751	90	4.306	0.409	0.174	3.925
60	60.3	8	10.047	33.255	25.583	92	18.336	0.020	1.056	16.785
80	81.1	7	9.424	33.577	25.937	92	23.437	0.010	1.247	23.531
100	100.3	6	8.957	33.723	26.127	92	25.739	0.021	1.796	27.368
200	200.5	5	8.142	34.103	26.551	92	32.111	0.041	2.035	42.683
400	403.2	4	6.247	34.167	26.868	93	37.748	0.024	2.809	68.274
600	604.4	3	5.155	34.303	27.111	93	41.073	0.039	2.985	92.425
800	808.8	2	4.452	34.403	27.270	93	42.851	0.004	2.877	110.10
1000	1010.1	1	3.788	34.469	27.393	93	43.399	0.008	2.829	125.43

Date Jul 01, 2006 22:06 Cruise: S306 Latitude: 37.614 Year: 2006  
 Project: CALCOFI Station: 60-60 Longitude: -123.608 Work week: 26  
 Platform: MCARTHUR II Cast: 34 Secchi Depth: --- Day of Year: 182

\* Note: Latitude and Longitude are reported in decimal degrees. '---' signifies no data.

### Physical and Chemical

DEP (m)	PRESS (db)	BTL #	TEMP (°C)	SAL (psu)	SIGMA T	TRANSMISS (%)	NO3 (μM)	NO2 (μM)	PO4 (μM)	SIO4 (μM)
0	0.8	12	15.004	32.927	24.373	86	0.186	0.031	0.023	3.416
10	9.3	11	14.995	32.926	24.375	86	0.171	0.032	0.147	3.464
20	18.9	10	14.967	32.917	24.374	87	0.192	0.031	0.027	0.031
40	39.5	9	11.845	33.052	25.106	90	8.687	0.194	0.598	3.026
60	59.8	8	10.201	33.307	25.597	92	19.086	0.041	0.975	15.684
80	80.8	7	9.632	33.624	25.940	92	24.166	0.014	1.449	21.912
100	99.8	6	9.347	33.773	26.104	92	26.070	0.021	1.825	25.712
200	200.5	5	8.205	34.076	26.521	92	31.704	0.045	2.260	39.716
400	404.9	4	6.201	34.152	26.861	93	38.046	0.009	2.686	67.536
600	605.5	3	5.121	34.283	27.098	93	41.274	0.006	2.867	91.725
800	806.3	2	4.518	34.402	27.262	93	42.960	0.007	2.846	106.64
1000	1010.3	1	3.987	34.456	27.363	93	43.196	0.000	3.096	117.36

### Biological

DEP (m)	BTL #	CHL (mg m-3 d-1)	PHAEO (mg m-3 d-1)	DEP (m)	% S. I.	CARBON (mg m-3 d-1)	PROD INDEX carbon/chl (mg m-3 d-1)	LIGHT DEPTH (m)
0	12	0.818	0.000	0	100	---	---	0
10	11	0.870	0.000	10	50	---	---	6
20	10	0.869	0.000	10	30	---	---	11
40	9	1.288	0.522	20	15	---	---	17
60	8	0.261	0.138	40	5	---	---	25
80	7	0.057	0.133	40	1	---	---	37
100	6	0.030	0.180	80	0.1	---	---	55
200	5	0.018	0.100					

### Integrated Value

Integrated values are 1.0% of Surface Intensity (S.I.)

Chlorophyll <i>a</i> :	38.77	mg m-2 day -1	Carbon Fixation:	214.18	mg m-2 day-1
Phaeophytin:	8.37	mg m-2 day -1	Productivity Index:	5.52	mg C mg Chl day-1
Mixed Layer	30	meters	PBOpt:	---	mg C mg Chl day-1

Date	Jul 02, 2006 0:38	Cruise:	S306	Latitude:	37.697	Year:	2006
Project:	CALCOFI	Station:	60-57.5	Longitude:	-123.427	Work week:	27
Platform:	MCARTHUR II	Cast:	35	Secchi Depth:	---	Day of Year:	183

\* Note: Latitude and Longitude are reported in decimal degrees. '---' signifies no data.

# Physical and Chemical

DEP (m)	PRESS (db)	BTL #	TEMP (°C)	SAL (psu)	SIGMA T	TRANSMISS (%)	NO3 (μM)	NO2 (μM)	PO4 (μM)	SIO4 (μM)
0	1.3	12	14.833	33.041	24.498	84	1.840	0.085	0.175	1.870
10	9.3	11	13.734	33.284	24.916	78	6.414	0.185	0.483	2.244
20	19.7	10	11.756	33.329	25.337	81	11.153	0.219	0.984	6.081
40	39.2	9	10.257	33.409	25.667	90	19.407	0.147	1.321	19.339
60	61.0	8	10.057	33.607	25.856	92	22.216	0.188	1.408	22.445
80	79.7	7	9.817	33.721	25.986	92	24.176	0.239	1.481	24.353
100	101.3	6	9.267	33.844	26.172	92	27.074	0.029	2.022	29.610
200	200.6	5	8.338	34.070	26.496	92	30.852	0.016	2.081	39.070
400	404.1	4	6.230	34.146	26.853	93	37.432	0.009	2.719	66.915
600	606.3	3	5.214	34.306	27.106	93	41.225	0.008	3.070	90.330
800	807.0	2	4.636	34.386	27.237	93	---	---	---	---
1000	1009.2	1	4.148	34.443	27.335	93	42.860	0.006	3.022	116.87

Date Jul 02, 2006 3:34 Cruise: S306 Latitude: 37.778 Year: 2006  
 Project: CALCOFI Station: 60-55 Longitude: -123.249 Work week: 27  
 Platform: MCARTHUR II Cast: 36 Secchi Depth: --- Day of Year: 183

\* Note: Latitude and Longitude are reported in decimal degrees. '---' signifies no data.

### Physical and Chemical

DEP (m)	PRESS (db)	BTL #	TEMP (°C)	SAL (psu)	SIGMA T	TRANSMISS (%)	NO3 (μM)	NO2 (μM)	PO4 (μM)	SIO4 (μM)
0	1.5	12	12.971	33.178	24.987	84	6.605	0.203	0.255	2.017
5	5.4	11	12.966	33.178	24.989	84	6.330	0.206	0.519	1.868
10	9.2	10	12.971	33.175	24.985	84	6.787	0.205	0.454	2.197
20	19.7	9	12.125	33.275	25.227	88	9.679	0.244	0.650	6.037
30	29.5	8	11.489	33.343	25.398	90	14.607	0.302	0.992	12.382
40	39.1	7	10.839	33.504	25.640	92	17.641	0.240	1.244	16.865
50	51.8	6	10.560	33.566	25.738	92	19.465	0.193	1.379	18.636
60	60.3	5	10.080	33.652	25.887	92	22.848	0.137	1.589	23.348
70	69.1	4	9.894	33.737	25.985	92	24.239	0.078	1.535	24.660
70	69.3	3	9.889	33.741	25.989	92	24.481	0.096	1.665	25.294
100	100.9	2	9.407	33.934	26.219	91	24.791	0.096	1.654	25.760
130	132.6	1	9.033	33.995	26.329	91	28.931	0.182	2.169	38.593

### Biological

DEP (m)	BTL #	CHL (mg m-3 d-1)	PHAEO (mg m-3 d-1)	DEP (m)	% S. I.	CARBON (mg m-3 d-1)	PROD INDEX carbon/chl (mg m-3 d-1)	LIGHT DEPTH (m)
0	12	2.134	0.138	0	100	---	---	0
5	11	2.124	0.312	5	50	---	---	4
10	10	2.369	0.051	10	30	---	---	7
20	9	2.557	0.228	20	15	---	---	11
30	8	1.589	0.282	30	5	---	---	17
40	7	0.486	0.230	40	1	---	---	26
50	6	0.266	0.419	60	0.1	---	---	42
60	5	0.275	0.357					
70	4	0.096	0.366					
100	2	0.085	0.427					

### Integrated Value

Integrated values are 1.0% of Surface Intensity (S.I.)

Chlorophyll <i>a</i> :	46.51	mg m-2 day -1	Carbon Fixation:	3442.1	mg m-2 day-1
Phaeophytin:	5.84	mg m-2 day -1	Productivity Index:	74.00	mg C mg Chl day-1
Mixed Layer	18	meters	PBOpt:	---	mg C mg Chl day-1

Date	Jul 02, 2006 5:47	Cruise:	S306	Latitude:	37.868	Year:	2006
Project:	CALCOFI	Station:	60-52.5	Longitude:	-123.064	Work week:	27
Platform:	MCARTHUR II	Cast:	37	Secchi Depth:	---	Day of Year:	183

\* Note: Latitude and Longitude are reported in decimal degrees. '---' signifies no data.

# Physical and Chemical

DEP (m)	PRESS (db)	BTL #	TEMP (°C)	SAL (psu)	SIGMA T	TRANSMISS (%)	NO3 (µM)	NO2 (µM)	PO4 (µM)	SIO4 (µM)
0	1.3	12	12.215	33.594	25.457	82	11.301	0.277	1.128	9.673
5	4.3	11	12.210	33.594	25.458	83	11.138	0.245	1.013	9.307
10	10.0	10	12.199	33.591	25.457	83	11.705	0.219	0.829	10.519
20	18.8	9	10.662	33.598	25.744	87	19.179	0.246	1.265	18.836
30	30.1	8	10.189	33.633	25.853	92	22.689	0.231	1.557	23.200
40	40.3	7	9.736	33.708	25.988	92	24.469	0.134	1.502	25.720
50	50.4	6	9.561	33.748	26.048	92	24.961	0.120	1.865	26.522
60	59.6	5	9.451	33.820	26.123	92	25.884	0.126	1.766	29.573
70	69.3	4	9.273	33.898	26.212	87	26.626	0.181	1.979	35.149
80	80.9	3	9.208	33.923	26.243	82	27.024	0.235	2.239	41.775
80	80.4	2	9.204	33.925	26.245	82	---	---	---	---
85	84.8	1	9.172	33.939	26.262	81	---	---	---	---

Date Jul 02, 2006 7:25 Cruise: S306 Latitude: 37.947 Year: 2006  
 Project: CALCOFI Station: 60-50 Longitude: -122.882 Work week: 27  
 Platform: MCARTHUR II Cast: 38 Secchi Depth: --- Day of Year: 183

\* Note: Latitude and Longitude are reported in decimal degrees. '---' signifies no data.

### Physical and Chemical

DEP (m)	PRESS (db)	BTL #	TEMP (°C)	SAL (psu)	SIGMA T	TRANSMISS (%)	NO3 (μM)	NO2 (μM)	PO4 (μM)	SIO4 (μM)
0	1.8	12	12.171	33.190	25.151	75	10.231	0.076	1.059	16.077
0	1.8	11	12.171	33.190	25.151	75	---	---	---	---
5	4.7	10	11.781	33.472	25.444	76	16.946	0.093	1.418	20.026
5	4.7	9	11.834	33.429	25.401	76	---	---	---	---
10	10.7	8	9.957	33.686	25.933	89	20.513	0.055	1.595	24.497
10	10.7	7	9.973	33.688	25.932	89	---	---	---	---
20	19.9	6	9.453	33.775	26.086	92	24.823	0.037	1.751	26.425
20	20.0	5	9.454	33.775	26.087	92	---	---	---	---
30	30.1	4	9.463	33.903	26.185	91	25.427	0.036	1.963	30.028
30	30.4	3	9.467	33.910	26.190	91	---	---	---	---
40	40.3	2	9.249	33.953	26.259	89	25.754	0.035	1.913	31.365
40	40.0	1	9.255	33.948	26.254	90	---	---	---	---

### Biological

DEP (m)	BTL #	CHL (mg m-3 d-1)	PHAEO (mg m-3 d-1)	DEP (m)	% S. I.	CARBON (mg m-3 d-1)	PROD INDEX carbon/chl (mg m-3 d-1)	LIGHT DEPTH (m)
0	12	7.417	0.772	0	100	---	---	0
5	10	5.565	0.423	5	50	---	---	2
10	8	2.265	0.746	10	30	---	---	4
20	6	0.611	0.503	20	15	---	---	7
30	4	0.508	0.615	30	5	---	---	13
40	2	0.165	0.201	40	1	---	---	23
				40	0.1	---	---	---

### Integrated Value

Integrated values are 1.0% of Surface Intensity (S.I.)

Chlorophyll <i>a</i> :	33.96	mg m-2 day -1	Carbon Fixation:	123.83	mg m-2 day-1
Phaeophytin:	11.71	mg m-2 day -1	Productivity Index:	3.65	mg C mg Chl day-1
Mixed Layer	7	meters	PBOpt:	---	mg C mg Chl day-1

**Table 4:** *Zooplankton Data.* This table lists the total biovolume and krill abundance measured at the twenty hydrographic stations—10 on CalCOFI line 67, 10 on CalCOFI line 60— where bongo net tows were completed during the PaCOOS cruise of June/July 2006. The data are listed by CalCOFI line, onshore to offshore and south to north.

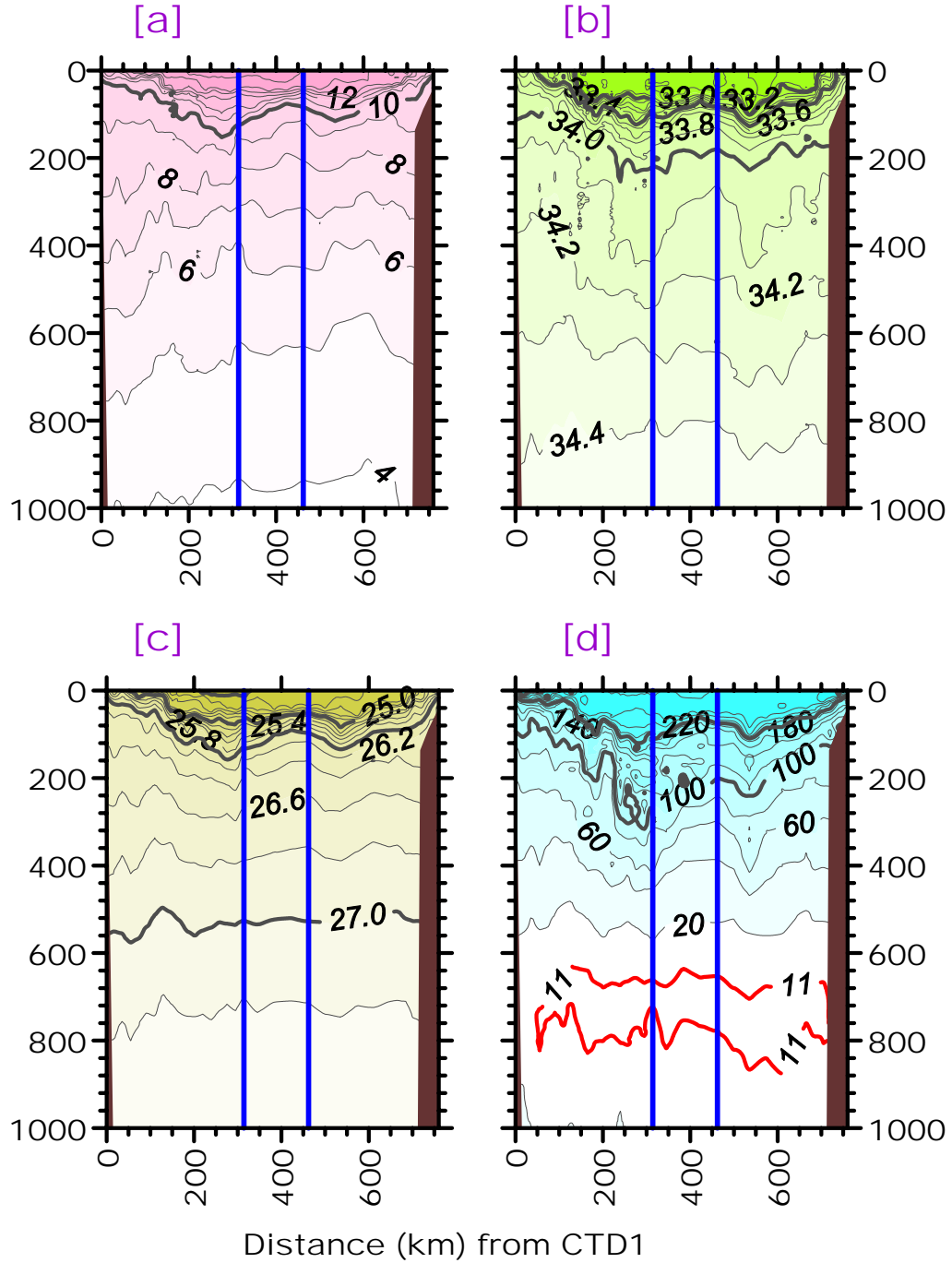
Station ( <i>CalCOFI</i> ) Number	Latitude (°N)	Longitude (°W)	Zooplankton Biovolume (ml/1000m <sup>3</sup> )	Krill Abundance (no./1000m <sup>3</sup> )
1 ( <i>67-C1</i> )	36.799	121.863	250	2146
2 ( <i>67-M1</i> )	36.736	122.020	893	3174
4 ( <i>67-55</i> )	36.620	122.416	281	180
6 ( <i>67-60</i> )	36.465	122.768	545	7077
8 ( <i>67-65</i> )	36.287	123.133	330	5428
10 ( <i>67-70</i> )	36.121	123.502	497	1511
14 ( <i>67-75</i> )	35.958	123.843	188	138
16 ( <i>67-80</i> )	35.798	124.194	217	564
18 ( <i>67-85</i> )	35.634	124.550	196	<i>No data</i>
19 ( <i>67-90</i> )	35.465	124.915	579	<i>No data</i>
37 ( <i>60-52.5</i> )	37.871	123.066	61	67
36 ( <i>60-55</i> )	37.774	123.256	304	3127
35 ( <i>60-57.5</i> )	37.697	123.440	380	5781
34 ( <i>60-60</i> )	37.622	123.609	72	<i>No data</i>
32 ( <i>60-65</i> )	37.454	123.970	75	414
31 ( <i>60-70</i> )	37.284	124.336	107	350
30 ( <i>60-75</i> )	37.113	124.686	268	3230
29 ( <i>60-80</i> )	36.954	125.063	153	10641
28 ( <i>60-85</i> )	36.782	125.405	237	863
27 ( <i>60-90</i> )	36.624	125.775	117	90



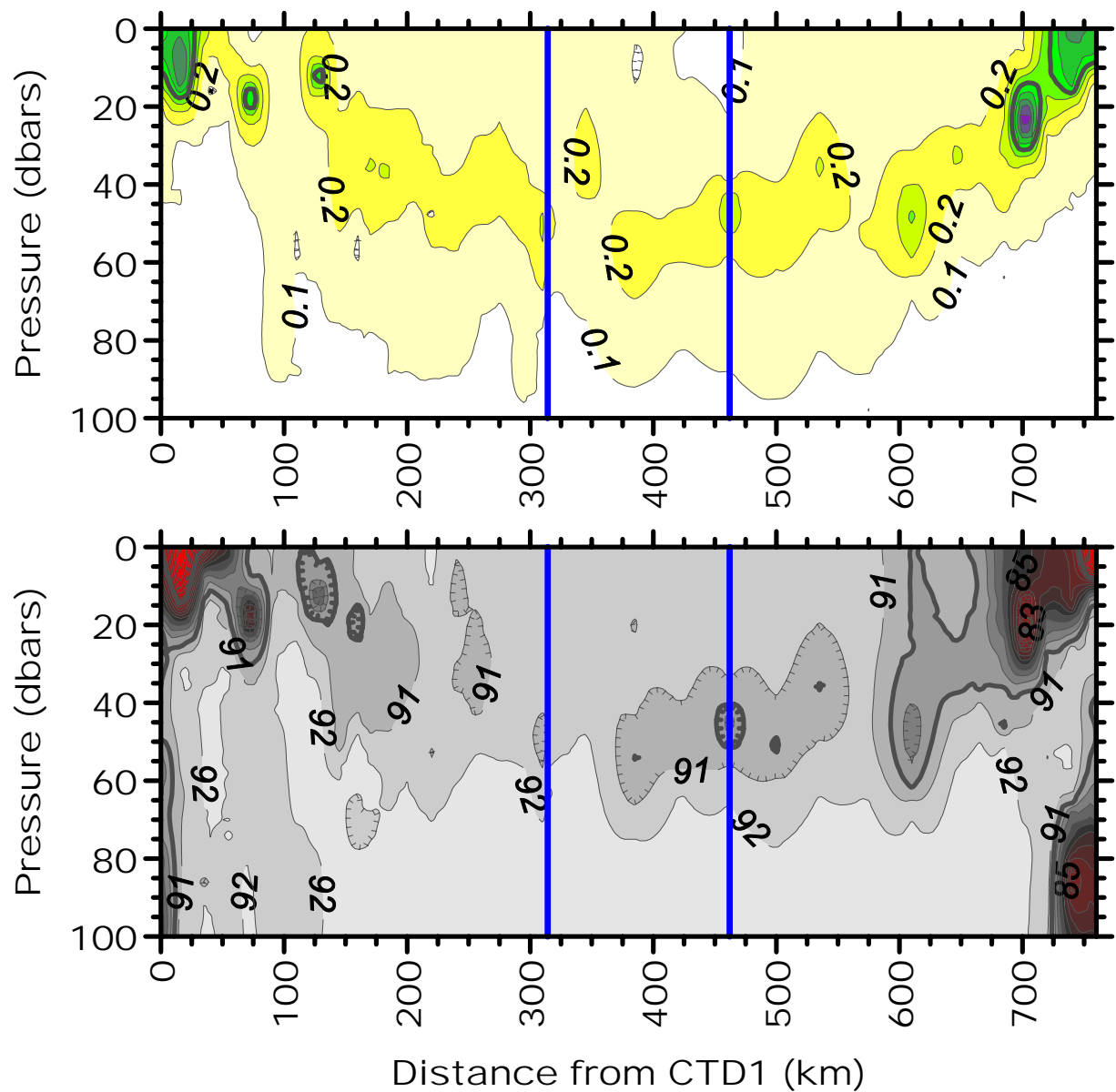
**Table 5:** *Marine Mammal Observations.* This table lists the results of the marine mammal observations made during the PaCOOS cruise of June/July 2006. The data are listed by species code, then chronologically within each species code.

Species Code	Scientific ( <i>Common</i> ) Name	Size of Group	Date of Sighting (mm/dd/yyyy)	Latitude (°N)	Longitude (°W)
21	Grampus griseus ( <i>Risso's Dolphin</i> )	2	7/01/2006	36.735	121.973
22	Lagenorhynchus obliquidens ( <i>Pacific White-Sided Dolphin</i> )	35	6/28/2006	37.235	123.446
27	Lissodelphis borealis ( <i>Northern Right Whale Dolphin</i> )	8	6/28/2006	37.235	123.446
40	Phocoena phocoena ( <i>Harbor Porpoise</i> )	3 2	7/02/2006 7/02/2006	36.786 37.767	122.682 122.622
44	Phocoenoides dalli ( <i>Dall's Porpoise</i> )	2	6/28/2006	36.503	122.653
74	Balaenoptera physalus ( <i>Fin Whale</i> )	1	6/30/2006	36.727	125.577
76	Megaptera novaeangliae ( <i>Humpback Whale</i> )	2 1 1	6/28/2006 7/01/2006 7/02/2006	36.677 37.776 37.891	121.225 123.250 121.822
79	Unidentified large whale	1	6/30/2006	36.603	125.809

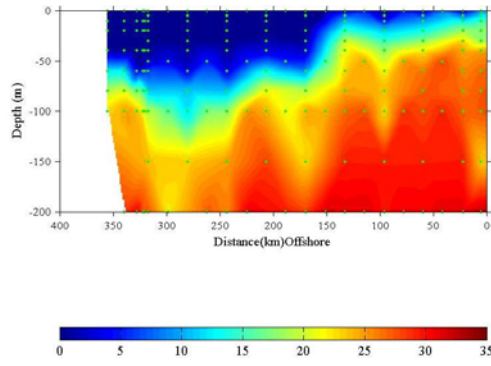
## Figures



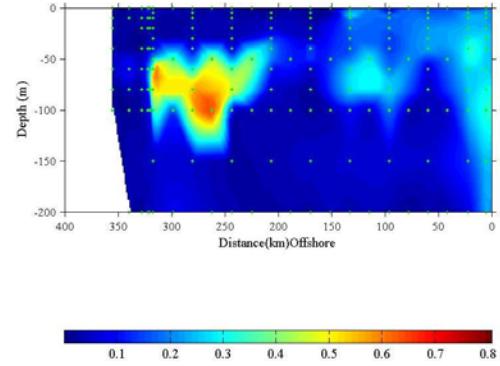
**Figure 3:** Contours of (a) temperature ( $^{\circ}\text{C}$ ), (b) salinity, (c) density anomaly ( $\text{kg m}^{-3}$ ), and (d) oxygen ( $\mu\text{m kg}^{-1}$ ) fields along the line of hydrographic stations from Moss Landing (on the left) to Point Reyes. The dashed blue lines indicate the locations of the corner hydrographic stations (CTDs 20-23 and 27). Contour intervals for panels a-d are  $1^{\circ}\text{C}$ ,  $0.1$ ,  $0.2 \text{ kg m}^{-3}$ , and  $20 \mu\text{m kg}^{-1}$ , respectively, except that the (nearly) oxygen minimum contour of  $11 \mu\text{m kg}^{-1}$  is highlighted in red in panel d.



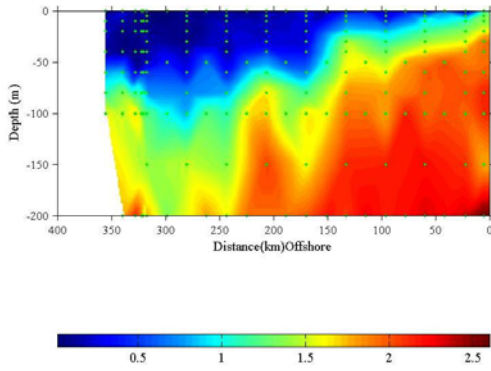
**Figure 4:** Contours of fluorescence (volts) [upper panel] and transmissivity (percentage) [lower panel] in the upper 100 dbars of the water column along the line of hydrographic stations from Moss Landing (on the left) to Point Reyes. The dashed blue lines indicate the locations of the corner hydrographic stations (CTDs 20-23 and 27). The contour intervals are 0.1 volt and 1 percent, respectively, for the upper and lower panels.



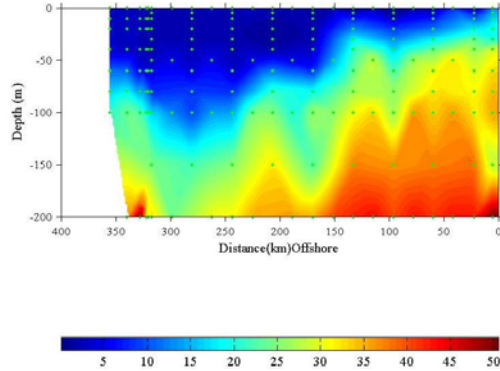
[a]



[b]

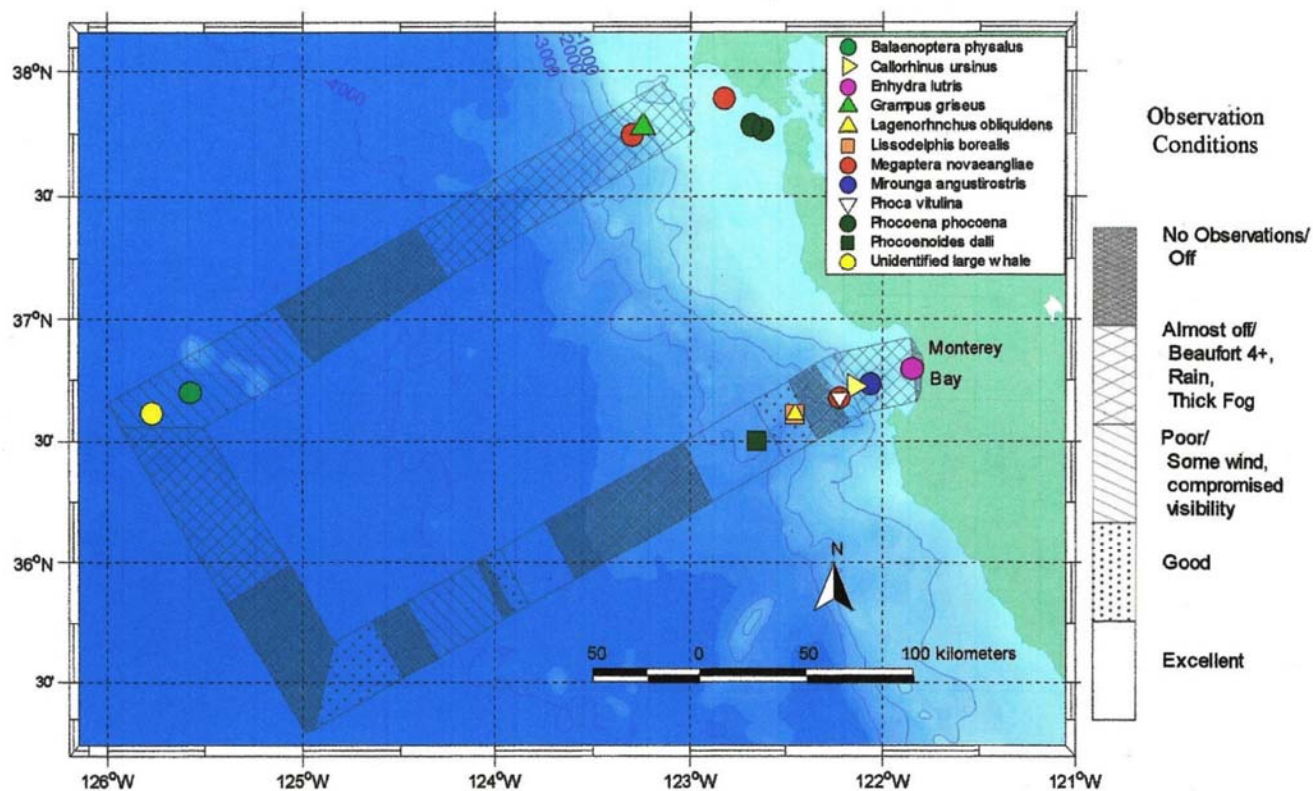


[c]

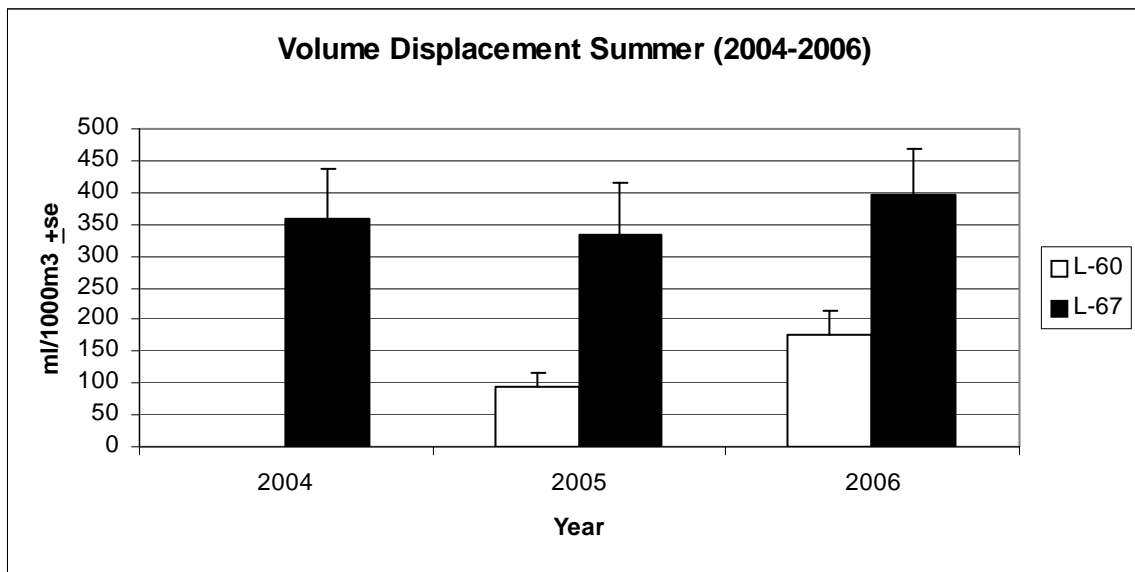


[d]

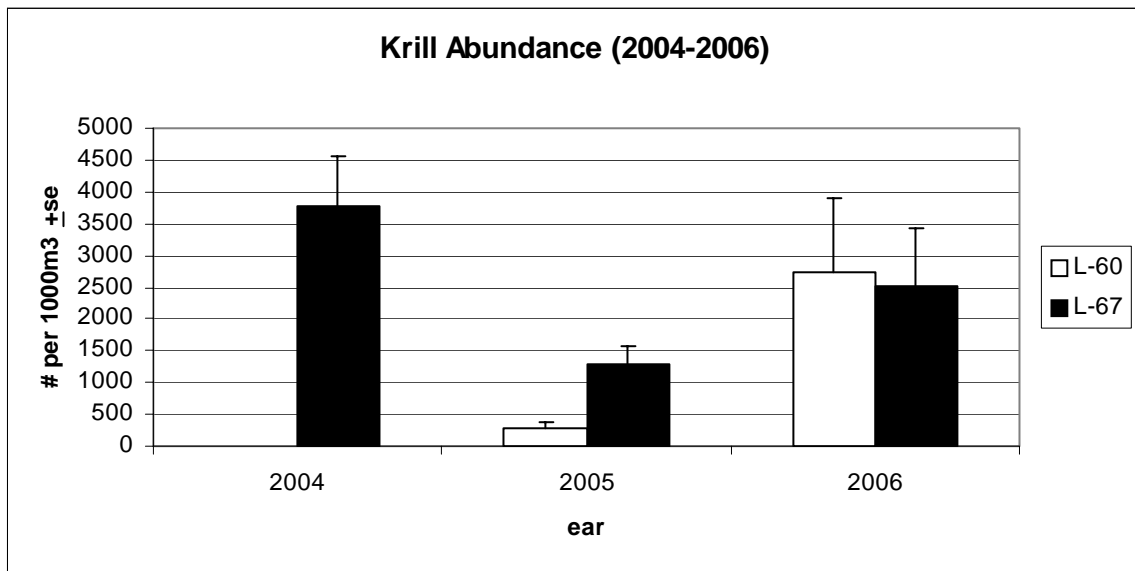
**Figure 5:** Contours of (a) nitrate ( $\mu\text{M}$ ), (b) nitrite ( $\mu\text{M}$ ), (c) phosphate ( $\mu\text{M}$ ), and (d) silicate ( $\mu\text{M}$ ) fields along CalCOFI line 67 from Moss Landing (on the right) to station 67-90 (CTD 23). The green dots indicate the water sample locations.



**Figure 6:** Locations of sightings of all marine mammals during the PaCOOS cruise of June/July 2006. Observational conditions are also shown in this figure.



**Figure 7:** *Biovolume displacement values for CalCOFI lines 67 and 60 collected during summers 2004-2006. Volume displacement values increased for both line 67 and line 60 relative to 2005 values. Additionally, data from 2006 displayed a pattern consistent with that of the previous year of higher overall values for line 67 relative to those for line 60.*



**Figure 8:** *Krill abundance for CalCOFI lines 67 and 60 collected during summers 2004-2006. Both line 67 and line 60 displayed increases in overall krill abundance relative to 2005. However, in contrast to 2005 results, krill abundance was slightly (though not significantly) higher for line 60.*

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